V I E W – M A S T E R® P E R S O N A L S T E R E O C A M E R A

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P E R S O N A L C A M E R A

REPAIR MANUAL

This manual is made up of two parts, part one (Sections 1.000 – 8.000) Set up is the following form for the analyzing and repair of specific problems.

- 1.000 Shutter
  - 1.100 Shutter sticks open when wound.
  - 1.200 Shutter sticks open when released on bulb.
  - 1.300 Shutter will not open.
  - 1.400 Half of pictures unexposed.
- 2.000 Winding
  - 2.100 Tears Film
  - 2.200 Jammed Winding knob.
  - 2.300 Winding knob WILL NOT lift.
  - 2.400 Winding knob will not lock.
  - 2.500 Loose set screw.
- 3.000 Top
  - 3.100 Sticky exposure dial.
  - 3.200 Broken level.
  - 3.300 Broken or chipped V. F. lens.
- 4.000 Tight Selector knob
- 5.000 Damaged lenses or DIAPHRAGM.
- 6.000 Double exposures and uneven spacing.
- 7.000 Flash troubles.
- 8.000 Scratches on film.

Part two of manual (Sections 20.000 – 24.000) consists of instructions on taking camera apart and reassembling it – as follows:

- 20.000 Bottom and back
  - 20.100 Remove bottom and back.
  - 20.200 Replace bottom and back.
- 21.000 Top
  - 21.100 Remove top.
  - 21.200 Replace top.
- 22.000 Front
  - 22.100 Remove front.
  - 22.200 Replace shutters.
  - 22.300 Replace front.
- 23.000 Movement
  - 23.100 Remove movement.
  - 23.200 Replace movement.
- 24.000 Timing and flash
  - 24.100 Timing and flash adjustment.
  - 24.200 Set for electronic “STROBE” flash.

Use part one for analyzing and repair of trouble referring to part two for instructions when necessary such as, remove and replace top, timing, etc.

For location of parts see photos.

P E R S O N A L C A M E R A

REPAIR INSTRUCTIONS

1.000 **SHUTTER**

The vast majority of all shutter repairs may be made by lubricating RATCHET wheel with “DAG 154” as described in this section (1.110 and 1.310). “DAG 154” is colloidal graphite diluted in ALCOHOL (1 part DAG to 7 parts alcohol). Acheson Colloidals Co., Port Huron, Michigan, U.S.A. If shutter does not open, check to be sure winding cycle is completed. If it is not, see section B “Winding.” Do not oil shutter blades or movement. “DAG” the ratchet wheels on all cameras repaired that have not previously been lubricated.

1.100 **Shutters stick open when wound**

This will cause blank clear pair on roll. Remove bottom and back.

1.110 Sticky Ratchet

Check to be sure RATCHET is working freely by holding release button down and winding camera. Operation of escapement must be smooth. If escapement is rough, lubricate #520 ratchet wheel with “DAG.” Check 520 ratchet gear and 509 gear sector for end play (MAX. 1008”). If escapement is still not working smoothly, it may be necessary to replace the 520 RATCHET wheel.

1.120 If escapement is working freely, check the following and repair accordingly:

1.121 Latch Engagement

The shutter must pick up the 082 primary latch. If it is not, bend ear of shutter blade so it will pick up latch. Do not over bend shutter ear as it will cause excess friction on flash switch. If shutter ear is broken off, remove front, replace shutter blade, reassemble and reinstall front. (See instruction “Replace Shutter.” 22.200.)

1.122 Overtravel Pawl:

Turn selector knob to “B” position. Release shutter and wind slowly. You will note that the 082 primary latch is picked up by the shutter blade and towards the end of the winding cycle as the latch is pulled back, it allows the 084 primary pawl to engage with the 082 latch and thus holding it in position. After the 082 latch and 084 pawl have engaged, the 082 should continue to move back and should have a minimum of .010” overtravel between 082 latch and 084 pawl. If overtravel is not correct, bend 522 lever assembly ear away from release button to increase overtravel. Care must be used not to bend 522 lever too far. Retest in “B” position, then turn to “A” position and retest. The 522 lever must not be bent so that it will bend the shutter blades at the end of it’s stroke. Recheck.

1.123 Tight Pawl

Check 084 pawl for freeness, If it is sticky or tight, very carefully press down on 084 pawl to get end play between 096 movement plate and 084 pawl, then lubricate with “DAG” 154.” (DAG 154 is colloidal Graphite in alcohol – Achenson Colloidals Company, Port Huron, Michigan U.S.A.)

1.124 Pawl Tension

Check tension of 084 pawl. It must have enough tension to engage the 082 latch every time (Min. 7 grams, Max. 15 grams). If tension is weak, movement must be removed and tension adjusted by turning 089-090 stud and spring with pliers, then restaking stud to hold it in new position. If spring is damaged beyond repair, remove 089-090 stud and spring and replace with new one, stake in lightly, adjust to proper tension, and stake or rivet in place. This requires removing movement from camera. (See section 23.100 and 24.100)

1.200 **Shutter sticks open when release in bulb.**

Remove bottom and back.

1.210 Sticky Shutter Blade

It is very seldom that you will find a sticky shutter blade above camera #1200. However, this should be checked for first by pulling shutters back and forth with wooden or plastic stick. If shutters are sticky, remove front, change shutter blades, and reassemble and install front according to instruction. (see section 22.000)

1.220 Weak Release Lever Spring

The 212 release lever sprint may be weak and there may be a little extra friction in movement. Tighten spring by cutting off three or so loops from the lever end, and lubricate in the following places: 083 latch and 506 floating lever where they engage, and edge of 109, which is beneath 519 plate assembly, 506 floating lever and 096 movement plate.

1.230 Ratchet

(See section 1.110)

1.300 **Shutter will not open**

This will cause blank (black) spaces on film. Remove bottom and back according to instructions.

1.310 Ratchet

Make test and repair as described in section 1.110

1.320 Pawl Engagement

The shutter blade must pick up the 083 secondary pawl. If ear is not correctly adjusted, bend to insure pick up. If ear is broken, remove front, replace, reassemble, and reinstall front. (See section 22.200)

1.330 Tight Latch

Check to be sure the 082 latch is free. If it is tight, press down very carefully on 082 latch to give end play between 096 movement plate and 082 latch, then apply “DAG” to 082 latch. If this does not free 082 latch, the tightness may be between the 082 latch and 088 latch stud, in which case the movement must be removed and the 088 stud, in which case the movement must be removed and the 088 stud replaced, then place the movement in camera according to instructions. (See sections 23.100 and 23.200)

1.340 Overtravel movement

You will note while winding the camera that just short of half way in the winding cycle the 112 release lever pawl engages the 506 floating lever assembly by latching the movement. After the 112 pawl has latched the 509 gear sector must continue up at least one more tooth (.030) to insure enough overtravel in movement assembly. If there is not enough overtravel, loosen three of the four movement mounting screws, leaving the one closest to the flash switch end of the camera tight. Move movement assembly toward back of camera and retighten the three screws. If assembly is moved too much, it will cause a bind in the winding. After adjustment is made recheck movement overtravel, pawl overtravel (section 1.222) and pawl engagement (sections 1.121 and 1.320).

1.350 522 Reset lever

522 reset lever must be free. (Section 2.210)

1.400 **Half of picture unexposed**

This is again very unusual. One of two things may cause it. Improperly adjusted flash switch which would catch and hold primary shutter blade before it is fully open. Readjust flash switch. See instructions. A 522 reset lever that is not working freely may cause the same condition. To free 522 reset lever. (Section 2.210) This may be cause in flash photography from flash being out of synchronization. (Section 24.000 and 24.100)

2.000 **WINDING**

2.100 **Tears Film**

Many times this is a result of improper loading of the camera; that is, by loading magazine in camera wrong and running film over top of magazine retainer bracket instead of under it; or by not setting exposure counter dial when loading film therefore, running to end of film before camera locks in “1” position which strips the film. An unusually tight film magazine may cause film to strip.

2.110 Tight Magazine Spool

The magazine spool as well as the film takeup spool should turn freely in the direction away from the center of the camera. The noise is made by a ratchet. Also they should both turn in a direction toward the center of the camera a little tighter, due to the slippage of a very tight clutch. These tests should be made by turning the spool with your fingers without moving the winding mechanism. Use another camera as a standard. If one or the other turns freely in both directions without making a ratchet sound, see section 2.130.

Tightness of 020 spool is usually caused by the fishhook shaped 310 spring, which will be found in cameras below serial no. 9800. This 310 spring is too tight around the 022 magazine spool, or by the 510 pawl assembly being tight in the frame. If magazine spool is tight, remove bottom, back and top according to instructions. Remove 034 shaft pin at top magazine spool. Also 033 spring, 217Y fiber washer, 022 magazine spool, 510 pawl

assembly and 020 pinion gear. The 510 pawl assembly may be tight and little hard to get out. On cameras under serial No. 9863, Install new 020 pinion gear and 510 pawl assembly.

Remove and discard fishhook shaped 310 spring. In it's space use a 311 spring, lubricate shaft 022 spring. In and slip 311 spring over end of 022 spool, inside radius up. The 510 pawl assembly must turn freely in hole in frame. The 020 pinion gear must turn freely on 510 assembly. 022 shaft must turn freely in 510 assembly before being assembled.

Re-Assemble in the following manner: Slip 020 gear on 510 pawl assembly, place 020 gear and 510 assembly in frame, install 022 spool and 311 spring from bottom and hold in place. Slip 217Y washer and 033 spring washer over 022 spool shaft and hold down and install 034 pin. Spool must turn freely against ratchet and slip with a little more tension against clutch. Use another camera as a standard if possible.

2.120 Tight Take Up Spool

Check as described above. Mark 503 large center gear and 551 lock gear (This gear with cam on top of it) so that they can be put back the same way. Remove 500 winding knob shaft assembly. Remove lock washer above 551 gear. Remove 551 gear. Remove 513 film spool assembly. Very carefully lubricate with flange. Use as little grease as possible. It may be necessary to weaken spring between spool and flange. Re-assemble. Drop 513 spool in frame, slip 551 gear over stud and align marks install snap ring. Replace 500 shaft. Reassemble top.

2.130 Loose Spool

Check as described in section 2.110. A loose spool is caused by the sprint on the 510 pawl assembly becoming unhooked. Disassemble as described in section 2.110 and 2.120. Rehook spring, be sure hook ends of spring are closed. Reassemble as described in section 2.110 and 2.140.

2.140 Magazine Retainer Adjustment

Lay a straight edge in tip of the film channel between top of film sprocket and frame. Looking at the camera from the bottom, you should be able to see only 1/3 of the dimple on the magazine retainer bracket. If not, adjust by bending bracket.

2.200 **Jammed Winding Knob**

This may be caused by on of two conditions in the movement and does not require a complete teardown. (See section 2.230) remove bottom plate and back according to instructions.

2.210 522 Lever Jammed

If winding is jammed in such a manner that the winding knob turns freely for about one-fourth of a turn in both directions but will not go further, this may be caused by the 522 reset lever becoming jammed with the 523 hour glass reset cam. Turn camera over, release shutter and watch movement while turning winding knob. Notice the 522 reset lever, it should be moving shutter blades, if it is not, pull 522 reset lever away from center of camera while turning winding knob. This should free winding knob, however, does not cure cause. This condition is caused from not enough clearance between 523 hour glass reset cam and

movement plate, or some other interference with the 522 reset lever. Increase clearance by very carefully prying up on movement with screwdriver. Test for freeness by sliding 522 reset lever back and forth.

2.220 Main Lever Hour Glass Cam Alignment

If winding knob turns free for about on half a turn, then binds and will not go further, but will reverse, it may be caused by a mis-alignment of the 506 main lever and 523 hour glass reset cam. The main lever rides around the contour of the 523 hour glass reset cam, which cocks the movement. However, the binding is caused by the main lever slipping off the edge of the 523 hour glass cam. With winding knob in normal position and the shutter released, pull the 522 hour glass cam away from the center of the camera and hold there. Looking through the large hole in the center of the movement plate, you see the 523 hour glass cam, and the main lever. If the main lever is lower than the 523 hour glass cam, very carefully, bend it up with a screwdriver. If it is higher, bend it down. Test by winding the camera faster than normally in both "A" and "b" positions.

2.230 Tight 510

If the winding knob binds in "B" position only, it may be due to and exceedingly tight 510 pawl assembly. If this is the case, follow the instructions in section 2.110. If any of the large gears (503, 534, or 551) are removed, be sure to mark, so as to replace in same position in relation to one another.

2.300 **Winding knob will not lift**

When winding knob will not lift to change setting, it will usually work on every other number. When changing setting you find the knob will not lift, release and wind shutter once and then change setting. This time it will work all right. If customer will stand this inconvenience, no repair is required. If repair is needed, remove top according to instruction. (Section 21.100) mark 503 large center idler gear and 551 thick lock assembly gear so that they can be put back the same way. Remove lock ring from stud above 551 gear. Remove 551 gear and file off .005" or .006" off bottom of the hub of 551 gear. This will lower gear. Clean off gear. Relubricate hold in gear hub if necessary. Replace gear and lock ring. Replace top according to instructions. (Section 21.200)

2.400 **Winding Knob Will Not Lock**

There are two conditions (A) Camera will not lock in "1" position at end of "A" before shifting to "B" and (B) Camera will not lock after on complete winding cycle.(Exposure)

2.410 Will Not Lock In "1" Position

This condition is very unusual. First check to be sure the winding knob is not loose. Turn selector knob to "A" and wind and release shutter 45 times to see if knob will lock at another position. If so, the 261 exposure counter dial may have slipped on knob or someone may have removed knob and replace it incorrectly. The shaft is spot drilled so the set screw will not slip on shaft. There are two set screws – One on top of the other in winding knob. If knob does not lock at all, it will require replacing 551 gear or 500 shaft or both. This should be done at factory if at all possible.

2.420 Winding Knob Will Not Lock After One Complete Turn

Check to see which position (A or B) that camera winds through in. Leave selector knob in that position. Remove bottom and back. Test to see if it still winds through. If it does not wind through with bottom removed, file back side of boss which is drilled with 5/23 hole to receive 500 shaft. This will allow lever to go farther forward.

If knob winds through even with bottom plate removed, it will be necessary to remove top of camera. Remove top. (Section 21.100) Release and wind shutter several timesl, noticing the way the 071 (X & Y) slides and 271 locking key are functioning during the winding cycles. Winding and locking cycle works as follows: 503 center idler gear turns and pulls one of the 071 slides with it and then releases it and 503 gear continues to turn. At same time, the movement is being cocked by the 523 hour glass cam. As movement cocks it, turns the 271 locking key which locks the 071 slides in place. The 503 gear is still turning and hooks the 071 slides. Because the 071 slides are locked in place, the 503 gear stops and is locked. When the shutter is released, it turns the 271 key back to an unlocked position. This leaves the 071 slides free to move so when the camera is wound the 503 gear turns and pulls one of the 071 slides with it, starting the winding cycle over again. If camera does not lock, it is usually caused by one of two things: Either the 503 gear is not locking tightly in the 071 slides, indicating damaged 071 slides or 503 gear; or the 271 locking key is not locking the 071 slides. Which one of these causes the trouble is determined by watching 071 slides during winding cycle. If the 071 slides do not move and the camera winds through the trouble lies between 071 slides and 503 gear.(Section 2.422) If the 071 slides do move, the trouble will lie in locking key. (Section 2.421)

2.421 Locking Key

Wind gears and watch key. If it does not turn (lock), the trouble will be in the movement, as it is not cocking (Section 1.340). If the key turns but fails to lock slides, it may be due to either the key being damaged on edge that locks 071 slides or the key being misaligned. Check for damaged edge and alignment. Key should be aligned so that with shutter released the back right hand (Camera’s right hand side) corner is just about touching the 071 slide.

If key is damaged, it is necessary to turn key around 180° or replace. Remove movement.(Section 23.100) remove 127 cam from bottom of 270 shaft below 271 locking key. Turn 271 key 180° and replace 127 cam on 270 shaft and lightly stake with center punch. For proper alignment, centerlines of 271 key and 127 cam should be lined up. Replace movement according to instruction. Check alignment of key. If not correct, remove movement and make adjustment by turning cam. When adjustment is correct, stake tightly and install movement. (Section 23.200)

If key is misaligned, remove movement and adjust as described in above section.

2.422 071 Slide

If key locks, slides do not move and still the camera winds

through, it is necessary to replace 071 slides and possibly 503 gear. Mark 551 gear, 503 gear, 534 gear, if possibly 503 gear. Mark 551 gear, 503 gear, 534 gear, if not already marked. Remove lock ring and 551 gear. Unhook back 212 spring at frame and unhook front 212 spring at 071 slide. Loosen top set screw in 515 film sprocket. Pull out 503 gear, 071 slides, 215 sprocket sleeve, and 075 sprocket spring. Remove 075 spring and 215 sleeve from gear. Remove 212 spring from 071X slide and replace on new 071X slide. Place new 071X slide on top of new 071Y slide (Both ears up), then place both slides over shaft of old 503 gear, with ears towards gear. Place 215 sleeve (Flange toward gear) and 075 spring over shaft of 503 gear. Holding 075 spring in place, place gear, slides, and springs in camera. Align marks on 503 and 534 gears and hold gear in place. Hook back 212 spring to frame, this should hold gear in place. Hook front 212 spring to 071Y. Turn 503 gear so that studs are at right angles to back of frame and cock movement by turning 515 sprocket. Place a 020" spacer between 503 gear and top back edge of frame and hold gear down tight against spacer. Turn 515 sprocket so set screws are facing back of camera. Line up center line of tooth (515 sprocket) with center of camera and tighten upper set screw. Check to be sure that the center line of the tooth is in center of camera. This is very important. Replace 551 gear and lock ring, be sure gear goes back properly. Retest winding in both "A" and "B" positions. If camera winds through, it may be necessary to replace 503 gear in which case repair as follows: Same instruction except the flash wire may have to be taken off the stud above the 534 gear and the 534 lifted and turned to find a place where they will turn together smoothly (Without feeling the gear teeth). Replace top. (Section 21.200)

2.500 **Loose Set Screw**

This is very unusual, but if a camera comes in stating "Defective Shutter or Winding," it may be due to a loose set screw in 515 film sprocket. See section above (2.422) for aligning instructions. Tighten set screw.

3.000 **TOP**

3.100 **Sticky Exposure Dial**

3.110 Check to be sure the speed and aperture dial are not interfering with the operation of the exposure dial. If it is, you can correct this by slightly bending up on the exposure dial.

3.120 If the exposure is free from outside interference it will require removing top to repair. Remove bottom and back (Section 20.100) and top (Section 21.100).

3.130 Disassemble as follows: Remove light seal, Viewfinder lenses and Cam Follower 118-517.

3.140 Check to be sure the pinion 118-545, and the exposure dial turn perfectly free. If not, remove screw on top of the exposure dial, remove exposure dials, washer, and pinion. Burnish hole a little with a .1251 diameter dowel pin, using a little lubricant. Clean hole with a pipe cleaner and reinstall pinion and dials. Be sure to engage 118-055 "Simmer-Winter" dial in

keyed pinion shaft. Test for freeness. If not perfectly free replace pinion 118-545.

3.150 Turn dials to F/6.3 and 1/58. Turn exposure dial to “Bright Sun” and “Average Subject”, and install cam follower and springs. With film speed at Summer 10, “Bright Sun” and “Average Subject” aperture dial on F/6.3 speed, dial should read 1/58 ±5%.

3.160 Test for freeness. If still sticky replace cam follower 118-517. Reassemble and test.

3.170 This is a very delicate assembly and a freeness is required in every part, so extreme care should be taken in working on this part of the camera.

3.180 Reassemble and test camera as per instructions. (Section 21.200, 24.100 and 20.200)

3.200 **Broken Level**

3.210 Remove bottom and back (Section 20.100) and top (Section 21.100)

3.220 Remove light seal and level assembly.

3.230 Replace with a new level assembly 118-516

3.240 Reassemble and test, (Section 20.100) and top (Section 21.100).

3.300 **Broken or Chipped View Finder**

3.310 Remove bottom and back (Sections 20.100) and top (Section 21.100).

3.320 Remove level assembly and V. F. lenses.

3.330 Replace with new lenses.

3.340 Replace level assembly.

3.350 Reassemble and test. (Sections 21.200, 24.100 and 20.200)

4.000 **TIGHT SELECTOR KNOB**

When the selector know is tight between A & B position, very carefully lubricate the 141X & Y large lens tunnel pins. These pins are located at the rear inside corner of the lens tunnels. Use lubricant very sparingly. We advise using “Oildag” in concentrated form (Achenson Colloids Co., Port Huron, Michigan, U.S.A) or an equivalent. Oildag is acoloidal graphite in oil. Do not change adjustment of set screws in top and bottom of lens tunnels as the optical center of lenses are aligned horizontally within ± .0005”.

5.000 **DAMAGED LENS OR DIAPHRAGM**

If camera taking lens or diaphragm is damaged, the camera should be returned to factory for repair.

6.000 **DOUBLE EXPOSURES AND UNEVEN SPACING**

Double exposures are causes by the incorrect operation of the camera, not the camera itself. They are caused by the operator’s not winding knob until it stops (locks), and then winding knob backwards, thereby causing two sets of double exposures. Camera should be wound till knob locks. Uneven spacing is caused by same way, only the operator wound the camera the right direction which causes one stereo pair to be little off the usual spacing. They may even overlap another pair a little.

7.000 **FLASH TROUBLES**

7.100 **Flash Bulb Will Not Fire**

It is best to check with another flash unit, as the trouble may be in the flash unit or in the way the unit was put on the camera. Trouble in flash attachment usually caused by the batteries being installed improperly. If you believe the trouble to be in the camera, remove the bottom plate. Check switch to be sure it is functioning properly (See Section 24.100). If flash switch is functioning properly, insert a piece of paper betwwn contact points, hold release button down and pull out paper, which should wipe points clean. Retest flash (Section 24.100). If flash still does not work, check tension of 129 switch blade (Thin blade with contact). If not correct, adjust as instructed (Section 24.100). If flash still does not work, try to "short out" flash unit with sharp scriber or similar tool between 128 switch main blade and frame. If this will "short" flash circuit, the trouble still lies in the switch, in which case very carefully file flash contact points. This will cure trouble, but be very careful not to get filings in camera. Wipe points with paper. If scriber did not short out circuit, the trouble lies in either the wire or the top. First, unsolder wire form flash switch, remove 2-56 X ¼ round head screw and spacer from back left hand (cameras left) corner of movement, and remove wire as much as possible to check for breaks. If necessary, remove top according to instructions. (Section 21.100) About the only thing left that could cause this trouble is the 163 blade not being bent up enough to contact the 167 washer or the flash wire has come loose from the 163. Make corrections and replace top. (Section 21.200)

7.200 **Flash Goes Off Before Shutter**

First check to be sure short is in camera and not flash unit. Remove back and bottom. Check flash switch for proper functioning (See Section 24.000) If switch is functioning properly unsolder flash wire and see if short is in wire. If flash unit is still shorted, the trouble lies in the wire or the top. If not, the trouble is in the switch. The only trouble the switch can give is that the 128 main switch blade may be shorting out on the 2-56 switch mounting screws. This can be cured by removing the switch, reworking insulators and re-assembling switch. If cause is still not found, remove top. (Section 21.100) If trouble lies in wire or top, remove 2-56 screw spacer (Section 7.100) and check for break in insulation. Left hand side (camera's left) of 163 blade to which flash wire is soldered should be at right angles to back of frame. Short may be in top, between 163 blade and mounting stud (Damaged or defective insulators), misaligned 163 blade, or in flash wire shorting against frame. If in doubt, replace flash wire or remove and check insulation. Repair short and replace top (Section 21.200). For adjustment instructions, see section 24.000.

8.000 **SCRATCHES ON FILM**

Scratches can be caused in mounting in reels, in cutting, in camera, or by careless handling. Examine film before cutting to determine if scratches were caused before cutting. Long horizontal scratches may have been caused by camera or cutter. Colored scratches are caused by

film being scratched before processing. Polish film channel lightly with crocus cloth to cure scratches on emulsion side. Great care must be taken not to get dust in camera. Polish pressure pads with jeweler’s rouge and a soft cloth to cure scratches on back of film. Care again must be used to keep dust out of camera.

P A R T T W O

20.000 **BOTTOM AND BACK**

20.100 **To Remove Bottom and Back**

Be careful not to disturb switch or movement parts.

20.110 Turn camera upside down and remove 7 screws.

20.120 Lift off bottom and remove back.

20.200 **To Replace Bottom and Back**

20.210 Be sure camera is timed and flash synchronized before reassembling.

20.220 Engage cover hinge pin in hinge pin hole in top, and close back.

20.230 Install and tighten 7 screws. The screws nearest the shutter release button should be tightened while holding the shutter release button in.

21.000 **TOP**

21.100 **To Remove Top**

A - Remove plastic window above advance indicator and advance indicator. Remove bottom plate and back according to previous instructions.

B - Set dials for 1/100 and F5.6, set winding knob in #1 position.

C - First turn to “B” and wind shutter. First top mounting screw may be seen by looking between flash switch and front casting and between release button shaft and end of front, when shutter blade spring is held out of the way, remove this screw. Release shutter and turn selector knob to “A”. The second top mounting screw may be seen at the other end of camera. Remove second screw. See photo of front for screw location.

D - Loosen magazine retainer screw, swing magazine retainer out of the way. Remove 310 spring (On camera numbers below 9800 only) and 2-56 fillister head screw from under retainer. Remove outer set screw on winding knob, loosen inner set screw then remove winding knob. Lift top, turn flat side of 510 assembly (Assembly on top of magazine spool) toward screw hole. Remove top.

E - Check view finder lenses and level.

Note: Steps “F Through “J” for cameras without new 311 spring on magazine spool (Cameras under #9800)

F - Remove 022 spool, 510 assembly, 020 pinion.

G - Lubricate shoulder of 022 spool with light grease and place 311 spring on 022 spool.

H - Place new 39 tooth, 020 pinion over new type 510 assemply and check for freeness.

I - Install 510 and 020 in frame. Check for tightness.

J - Install 022 and 311 in assembly. Place washers 217K and 033 over 022 shaft and insert 034 pin. Check for freeness of entire assembly.

21.110 Make Following Check Using Another Camera As A Standard

A - Wind gears both directions to be sure 510 assembly rotates in a clockwise direction only.

B - Test tension of shaft 022. This test can be made by comparison with another camera.

C - Shaft 022 must be free enough to allow the weighed screwdriver to rotate it when the screwdriver is inserted in slotted shaft. Use another camera as standard.

D - Check for tight gears. Wind twice in both “A” and “B” position.

21.200 **Re-Assemble Top**

A - Turn selector knob to “B” position. Turn 500 shaft to 1 position. Turn flat side of 510 assembly toward screw hole.

B - Turn speed cam to 1/100 position. (The highest point of cam).

C - Set diaphragm at F5.6 position. Use special plug gauge of .137 inch diameter.

D - Be sure washers 216 Steel and 205 felt are in place on speed cam shaft. Remove top plate, set dial for 1/100 and 5.6.

E - Install top assembly. Watch view finder lens and match pinion with rack. Be sure speed cam shaft fits into speed dial correctly.

F - Check F5.6 setting with special plug, .137 inch diameter. Check speed dial alignment 1/100 high point on cam. (Bulb lowest).

G - Install and tighten down one 2-56 X ¼ flat head screw next to winding knob shaft..

H - Check both dials for free operation.

I - Check for chipped view finder lens.

J - Install and tighten one 2 56 X ¼ fillister head screw near magazine spool.

K - Position and tighten magazine retainer. Retainer should be so aligned that a straight edge laying along film channel ways will show about 1/3 the dimple (On retainer) below straight edge.

L - Place winding knob to “1” position. Tighten and set screw. Be sure set screw enters recessed spot on shaft.

M - Turn selector knob to “A” position, set winding knob counter at “2” release shutter and wind until knob locks. Knob should wind freely without catching. Release shutter. Knob should be locked in position without catching. Release shutter, knob should be locked in one position. Lift knob and set winding knob at “3” position, release shutter and wind twice, checking camera for smoothness in winding and locking in “1” position. While checking camera for locking in “1” position, check to be sure that take-up spool rotates freely.

N - Turn selector knob to “B”.

O - Turn winding knob to stop.

P - Insert one 2-56 X ¼ in. round head screw, between release shaft and switch boss. Tighten this screw with solid screwdriver.

Q - Turn selector knob to “A” and release shutter.

R - Insert another 2-56 X ¼ in. Round head screw. Tighten this screw with solid screwdriver.
S - Lubricate advance indicator threads with CD33. Install travel indicator using special tool. Be sure that indicator is not eccentric and paint is not chipped. This is done on cameras above #9800 only. Install plastic window.
T - Replace top plate with three 0-90 screws. Check exposure dial, with summer set at 10, average color and bright sun lined up, setting should be F6.3 at 1/58±5%.
U - Check aperture dial and speed dial for free and even movement.
V - Check front view finder lens for chips.

22.000 **FRONT**

22.100 **Remove Front**

A - Remove bottom and back according to instructions. (Section 20.100)
B - Turn selector knob to "B" and wind. The first mounting screw may be seen by looking between flash switch and front, and between release button shaft and end of front casting, when shutter blade spring is held out of the way. Remove this screw. See photo for screw location.
C - Release shutter. The other mounting screw may be seen at the other end of camera between the front and the frame. With selector knob in "A" position, remove this screw.
D - Place camera face down on a bench and remove four 1-72 frame mounting screw.
E - Unhook spring from release lever.

22.200 **Replace Shutter**

A - Remove bottom and back according to instructions. (Section 20.100)
B - Remove selector knob and crank assembly (118-524) by removing screw on top of selector knob.
C - Remove shutter pad. Note how it is positioned in the front so it can be replaced properly.
D - Remove <u>lower</u> selector blade retainer (Older models have a screw holding lower retainer in place)
E - Remove selector plate.
F - Remove shutter blades by lifting front end and allowing the shutter to go foreword.
G - Replace shutter blades with new ones if necessary. <u>Be sure shutter blades are free of oil and are clean.</u> Rehook shutter springs to front casting. If shutter bearing studs are worn it may be necessary to burnish with a smooth edge of a piece of sheet metal, or special file.
H - Replace selector plate with embossing toward front of casting and the slot for selector wire assembly towards top of casting.
I - Replace selector plate retainer and restake in position. Retainers must be straight, not bent up or down. Selector plate must slide freely and not interfere with shutter blades. Shutter blades must of course, slide freely.

J - Pull shutter blade back a little ways and install crank assembly 118-524. Crank assembly must be indexed in teeth of selector plate so that when the lower holes are in position, (Selector plate slides to the right) the crank must be pointing down. Install selector knob in “A” position; selector knob guard 118-152; washers 118-171; and 2-56X¼ flat head screw.

K - Check freeness and operation of entire assembly. Be sure shutter pad 118-218 is in proper position with cut out section toward back and down.

22.300 **Replace Front**

A - Push selector wire away from center of camera (See photo of frame) lenses to top position. Release movement and be sure both panels are in released position. Be sure pressure pad is in proper position (Section 22.200-C), turn selector knob to a little shot of “B” position.

B - Place front assembly in position, hooking release button shaft in release lever, (of movement). Be sure to get flash switch blade between movement plate and release latch. Be sure release lever spring is free and not being pinched between front and frame.

C - With front assembly entered on butt side of frame, turn selector knob towards “B” as far as possible.

D - Place assembly on bench and turn selector knob back and forth pressing down lightly until crank assembly enters hole in frame and front assembly is completely seated.

E - Check to be sure selector wire has entered slot in selector plate.

F - Check to be sure pad is still in proper position (<u>This is Important</u>)

G - Check switch for proper position.

H - Install and tighten four 1-72 X 3/12 fill head screws.

I - Hook release spring into hole in frame.

J - Check entire assembly, both in “A” and “B” position.

K - Turn selector knob to “B” position and wind camera until it locks.

L - Insert on 2 56 X ¼ In” round head screw between release button shaft and switch boss (See photo). You will need a thin starter screwdriver for this. Tighten with solid screwdriver.

M - Turn selector knob to ““B” and release shutter.

N - Insert another 2-65 X ¼ In” round head screw at the other end of front. Tighten with solid screw driver. <u>Note</u>: These two screws hold the front and top firmly together, and are sometimes difficult to locate. See Photo.

O - Recheck entire assembly.

23.000 **MOVEMENT**

23.100 **Remove Movement**

A - Remove bottom and top. (Section 20.100 and 21.100)

B - Unhook release spring from release lever.

C - Remove two 2-56 X ¼ In” round head screws from back edge of movement at escapement end. <u>Note</u>: Do not remove 1-72 X 1/8

In” round head screw holding small escapement to movement plate.

D - Remove 2-65 X ¼ In” round head screw and 188-255 spacer at the other end of movement (rear side).

E - Unhook 118-122 spring from 118-522 reset assembly. Remove screw 118-118 being careful not to loose 118-117 spacer from under movement.

F - Remove movement from frame.

23.200 **Replace Movement**

A - Place camera upside down and set 118-117 spacer in place and place movement in position and install 118-118 screws. Be sure locking pawl 118-127 is engaged in 118-112 release latch. Rehook 118-122 spring.

B - Install two 2-56 X ¼ In” screws.

C - Install one 2-56 X ¼ In” screw and 118-117 spacer.

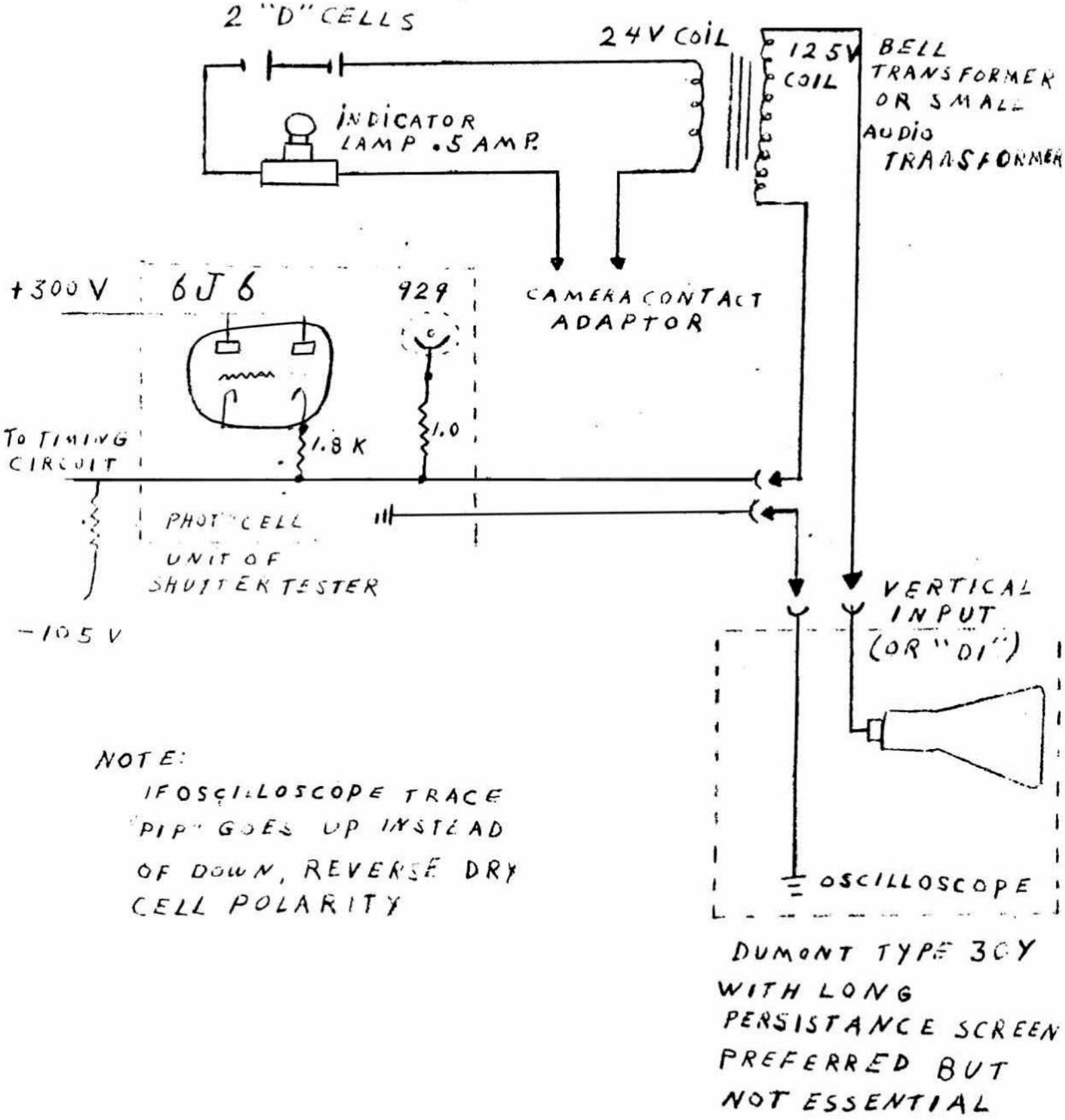
D - Move movement as far as possible toward switch end of camera and tighten all four screws.

E - Wind camera, checking operation of movement. If escapement is not cocking loosen three screws at opposite end from switch and move movement toward rear of camera and retighten screws. If there is a tight spot in winding loosen same screws and move movement forward. Retest.

F - Rehook release spring.

G - Replace top (Section 21.200)

SYNCRONIZATION SWITCH TESTER



NOTE:
IF OSCILLOSCOPE TRACE "PIP" GOES UP INSTEAD OF DOWN, REVERSE DRY CELL POLARITY

DUMONT TYPE 30Y WITH LONG PERSISTANCE SCREEN PREFERRED BUT NOT ESSENTIAL

24.000 SHUTTER TIMING AND FLASH SYCHRONIZATION

The personal camera is designed and built so that, if properly times at 1/100 of a second, all the other speeds will be in correct time. All cameras leaving the factory are timed to within ±10% and checked on all marked speeds except 1/15.

We recommend that the flash switch be adjusted by the use of an oscilloscope with a shutter timer. See wiring diagram). The use of an oscilloscope has many advantages over just a shutter timer, since it not only will synchronize the flash for you but will tell you if the switch points are bouncing, or if the points are not making good contact. An oscilloscope will also tell you if there is any malfunctioning of the shutter blades (Section 24.100 – Q). For these reasons, we strongly advise the use of an oscilloscope with your shutter timer for timing shutter and flash synchronization.

If an oscilloscope is not available for use in testing the camera, your present timer may be adapted to timing the “Personal Camera”. For instruction on adjusting timing see sections A, D, E, F, G, I, & R; For instruction on adjusting the flash synchronization see sections J to Q. Switch should be adjusted very carefully as too much tension on the drive blade (See diagram, Section 24.200) will cause improper contact or “Switch bounce.”

24.100 Adjustment of Shutter and Flash Synchronization.

A - Camera assembly complete, Less back and bottom plate.

B - Turn on shutter timer and oscilloscope. Set oscilloscope as follows:
”Sync. Selector” at “Int.”, “Sync. Amplitude” at +30”, “Sweep Vernier” at “80”, “Sweep Range” at “10”, “Y Axis Volts Full Scale” at “100 DC”, “Y Axis Multiplier” between “1.0 and “1.5, “X Selector” at “Sweep Driven”, “X Amplitude” at “32, “Focus” as required for sharp trace, “X Position” and “Y Position” as required to position trace, and “Intensity” as required.

C - Place camera in tester with lens opening at “3.5” shutter speed on “Bulb”, and shift knob on “A”.

D - Close shutter; set shutter speed to “1/100 (Always move shutter speed knob clockwise to selected position).

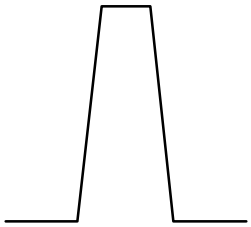
E - Wind camera knob, and release shutter.

F - Read the shutter speed on the timer scale. Repeat for three readings.

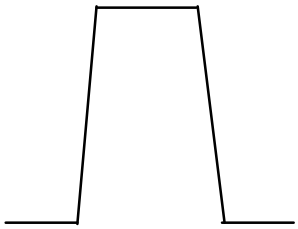
G - Remove camera and adjust speed by bending very slightly the hook end of the floating lever. (See photo of movement) Bending this hook toward the secondary latch will increase the exposure; Bending it away from the secondary latch decreases the exposure. Therefore, if the shutter reads .005 or nothing, bend the hook toward the latch, but if the shutter reads .015 or .020, bend the hook away from the latch. Several tries may be required to adjust the shutter between .009 and .011

After adjusting the floating lever hook, replace camera in tester and wind camera. Trip shutter. Read timer scale.

H - When tripping the shutter during this 1/100 test, ovserve the oscilloscope and note that the trace is thus:

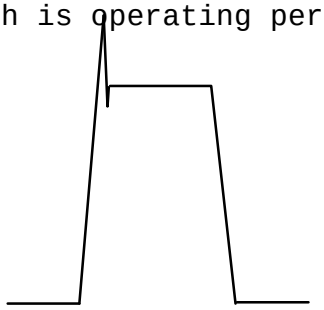


I - Set shutter speed to 1/50 and check speed and oscilloscope trace. Speed should be .018 to .002.



(See Section 24.100 – Q for details of analyzing this trace)

J - Attach camera flash connection to top of camera. Watch oscilloscope during 1/50 exposure now. It should look thus if the switch is operating perfectly:



In order to understand better the picture on the screen in terms of the adjustment and operation of the switch, let us examine the picture in terms of the mechanical movements of switch and shutter.

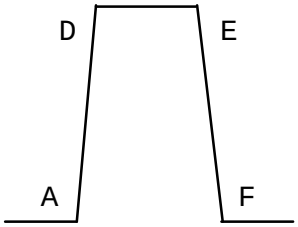
First however, let us review briefly the operation of the oscilloscope in making the picture. The oscilloscope trace, or picture, Is formed by a bright spot moving from left to right across a light-retentive screen. When the oscilloscope is adjusted, the spot moves the length of the line in very nearly 0.1 second when triggered. Therefore, the horizontal position of the spot is a function of time:

(1) By the amount of light reaching the photocell.

(2) By the flash gun current through the shutter switch contact.

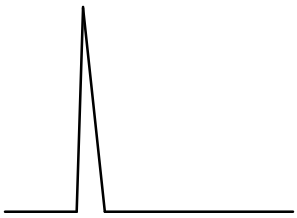
The results of (1) are clearly demonstrated by the

oscilloscope pictures shown in sections 24.100 – I. The camera shutter normally blocks the light from the photocell, and oscilloscope spot moves over the same line until the shutter is released and starts to pass light to the photocell at “A”. As the shutter moves very rapidly, the spot rises almost perpendicularly until the shutter is fully opened, “D”. As long as the shutter stays fully opened, the spot will travel horizontally to the right of “D”, but in a shutter opening of 1/50 second it will get only to “E” before the shutter starts to close. The period during which the shutter is closing is depicted by the line from “E” to “F” as the full brightness fades to total darkness at “F” and stops there, permitting the spot to continue over across the bottom of the screen.

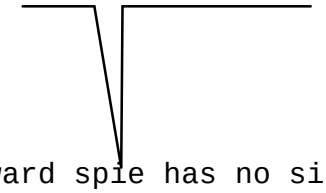


When oscilloscope is adjusted properly, the trace will “Trigger” only when shutter is released or flash circuit closes’

As previously stated, the current through the shutter switch contacts also controls the vertical motion of the spot. This is done by a circuit using the same electrical characteristics as a flash bulb in a flash gun, and is arranged to give a conspicuous vertical spike at the instant the contact is closed or opened. For example, if a camera with a properly adjusted switch is attached to the flash connection, and the release button operated without a light beam, the oscilloscope spike will look thus when the button is pressed and the switch closed:



And thus when the button is released and the switch opened:



This downward spie has no significance in out shutter testing,

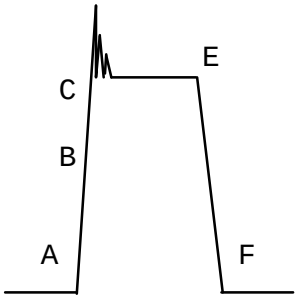
as it occurs during an untimed period in the shutter operation.

However, the upward spike marks the instant the switch starts to close and therefore is an important marker.

Refer now to the preferred picture for 1/50 second shutter and switch timing shown in section 24.100 – J the point “A” marks the start of the shutter opening and “D” the point when the shutter is fully opened, “E” the point when the shutter starts to close, and “F” the final closing of the shutter. During the interval from “S” to “D”, however, the switch has closed. “B” marks the time of initial contact of the switch members and “C” is the time of full electrical contact. The point “C”, then, is the point when the flash bulb would be connected to the batteries in the flash gun in actual flash photography.

For proper flash photography, the point “C” should occur almost simultaneously with “D”. This allows almost the full shutter timing interval for the flash bulb to heat up to the flashing temperature and to remain bright the duration of it’s flash before the shutter closes.

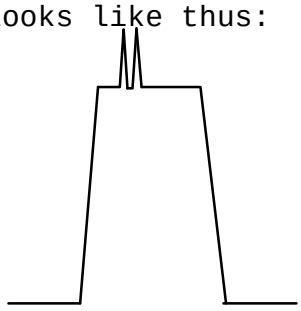
K - If the picture at 1/50 second looks thus:



The switch is making poor contact and bouncing. Adjust switch so that contacts are separated about 1/64 inch (.006 Min.) when the release button is out, bending the heavy brass switch blade to adjust to 1/64 (.006 Min.)

If necessary, bend moving switch blade to insure a contact pressure at least 4 grams, and bend the drive blade hook to give maximum clearance with the moving switch blade in the closed position. Switch bounce is usually caused by insufficient clearance between the hook and the moving blade when the switch is closed or insufficient contact pressure.

L - If picture looks like thus:



Bend the finger of the switch drive blade to contact the shutter blade ear earlier and bend drive blade hook to permit contacts to close earlier. In adjusting the switch drive blade finger, be sure that it is not bent far enough to ride

over the front side of the shutter blade ear. - - It must be safely rearward.

M - Check to see that drive blade has ample tension to open contacts and that it does not wedge behind the shutter blade in a manner to place excessive friction on the shutter blade. The shutter blade should slide to the end of it's travel without hesitation when the winding knob is turned slowly back and forth.

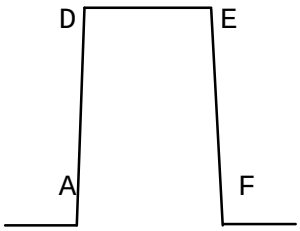
N - Any irregular motion or unusual sounds accompanying the slow turning of the winding knob should be investigatd and correted. Remember that this is the final testing operation on the camera.

O - Note that the winding knob locks at "1". By setting the knob at a position equivalent to "0", you can trip the shutter some 40 times before coming back to the locked position.

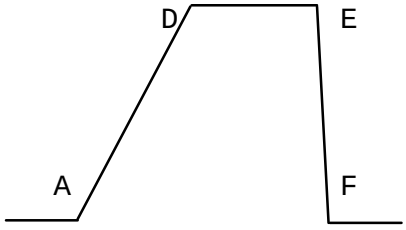
P - The indicator lamp burns when the shutter switch is closed and should always turn off when the release button moves outward. If it does not, bend the heavy switch blade to give about 1/64 opening between the contacts. If the movement plate ear is bent rearward enough to cause contacts to partially close when "Release Button" is fully out, straighten movement plate ear. Then recheck switch action on oscilloscope.

Q - Analysis of oscilloscope picture in terms of shutter blade action.

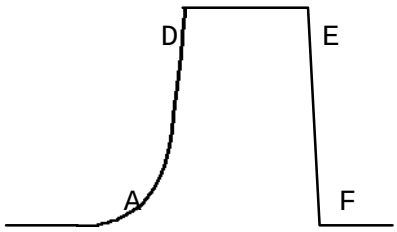
faulty operation of the shutter blades is also shown by the oscilloscope picture. Operation of the front blade, which uncovers the lenses, is shown by the trace from "A" to "D":



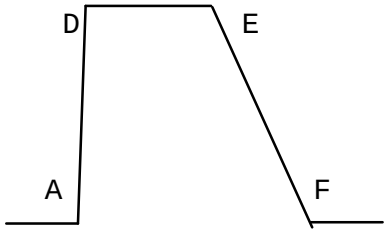
Normally "A" "D" is nearly vertical, starting with a small radius at "A" and ending with a small radius at "D". If the front blade is uniformly slow, the picture will be:



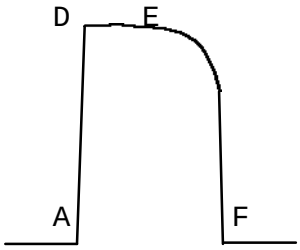
If the blade starts slowly, then accelerates to normal speed:



The rear blade which cover the lenses and terminates the exposure, will be shown by the line “E” to “F”. If the blade is uniformly slow, the picture will be:



If this blade starts slowly and then accelerates to normal speed, the picture will be:

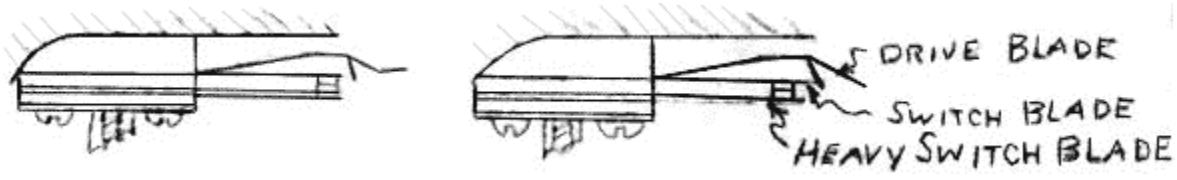


With this information all being shown by the oscilloscope picture, it should be apparent that the operator must observe carefully the oscilloscope trace on the 1/100 and 1/50 setting before attaching the flash connection. If any abnormal condition exists, correct it before continuing with the shutter and switch testing.

R - With the flash connection on the camera, Check the shutter timing at 1/50 (should read from .018 to .044); then, at 1/10 (should read from .09 to .11) Check all shutter speeds after the flash is adjusted.

24.200 **Set Flash For Strobe**

A strobe unit, which has an adjustable delay on it can be used with the “Personal Camera” without any change to the camera simply by adjusting the delay to 7 milliseconds. In order to use a strobe unit that has no delay, a change in the flash switch adjustment may be necessary. Remove bottom and back from camera. It will be necessary to bend the switch drive blade so that it looks thus:

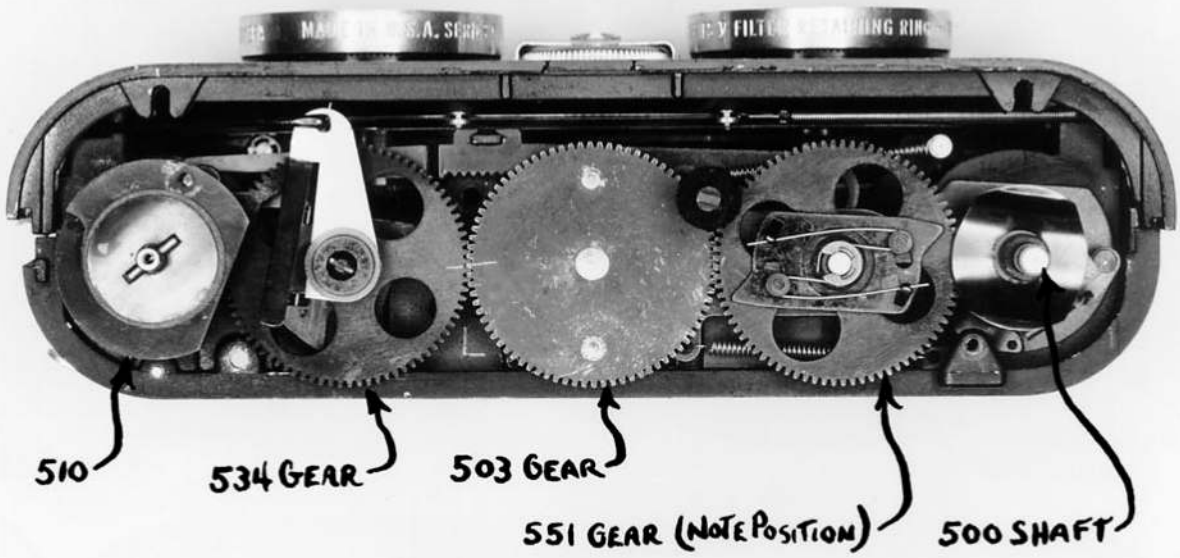


Switch set for strobe Normal Switch
(Note difference in drive blade)

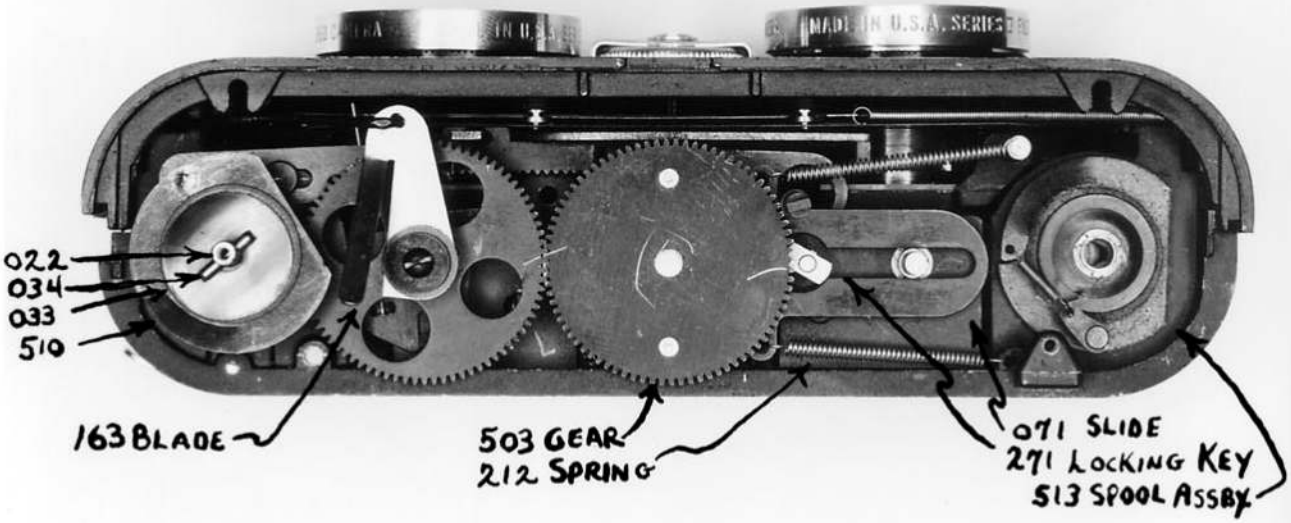
This adjustment is made to bring pint “B” (See diagram Section 24.100 – J) as close to “D” as possible. Follow instruction in “Shutter timing” (Section 24.100) except for above noted change. Adjustment can be double checked by connecting strobe unit to camera and releasing shutter while looking through camera.

VIEW-MASTER Personal STEREO CAMERA
B
MATCHED VIEW-MASTER ANASTIGMATS
f3.5 25-mm COATED

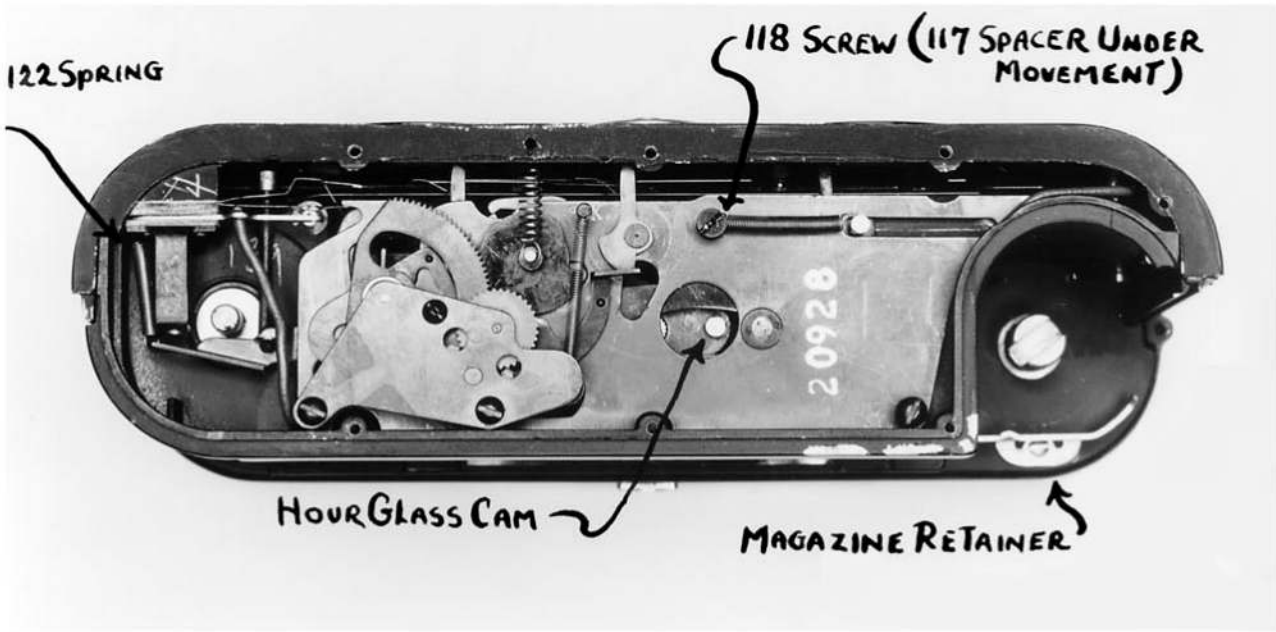
887

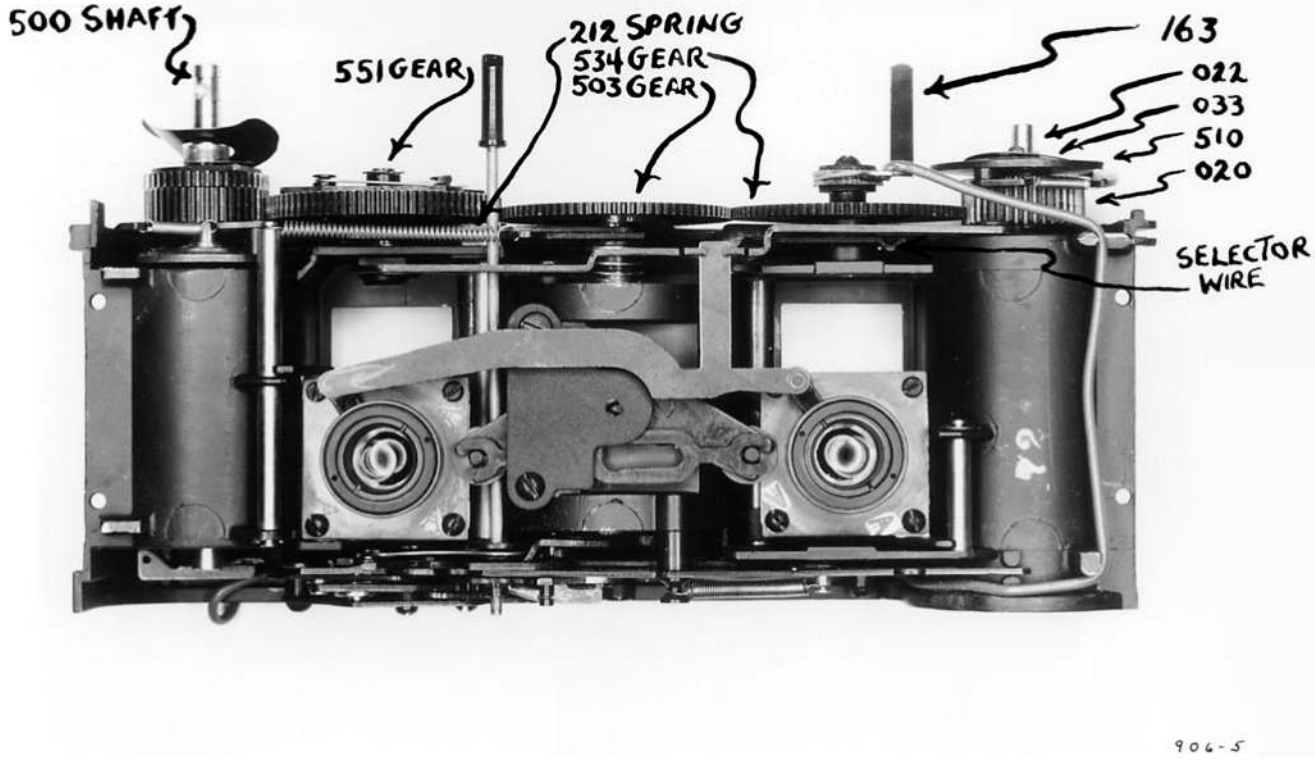

510
534 GEAR
503 GEAR
551 GEAR (NOTE POSITION)
500 SHAFT

906-4

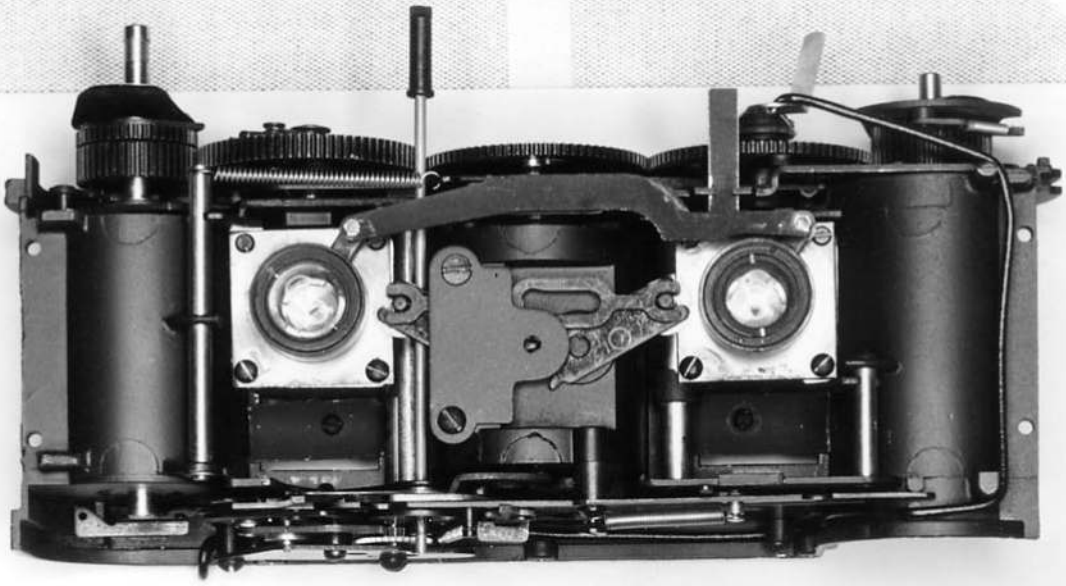

022
034
033
510
163 BLADE
503 GEAR
212 SPRING
071 SLIDE
271 LOCKING KEY
513 SPOOL ASSBY

906-3

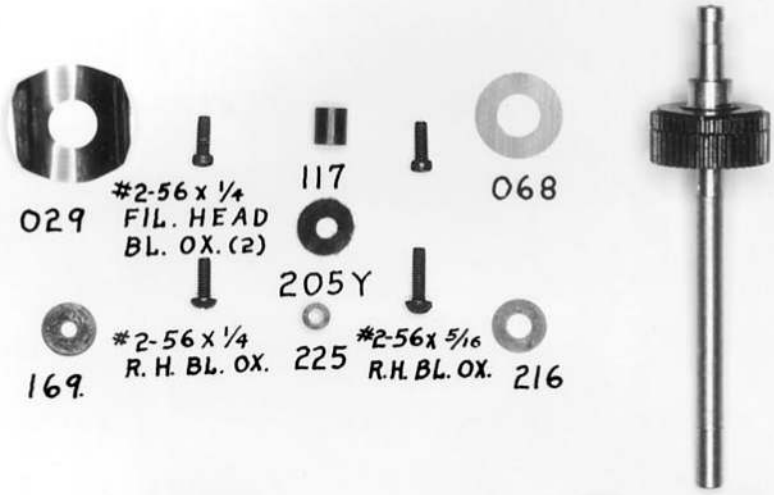

122 SPRING
118 SCREW (117 SPACER UNDER MOVEMENT)
20928
HOUR GLASS CAM
MAGAZINE RETAINER

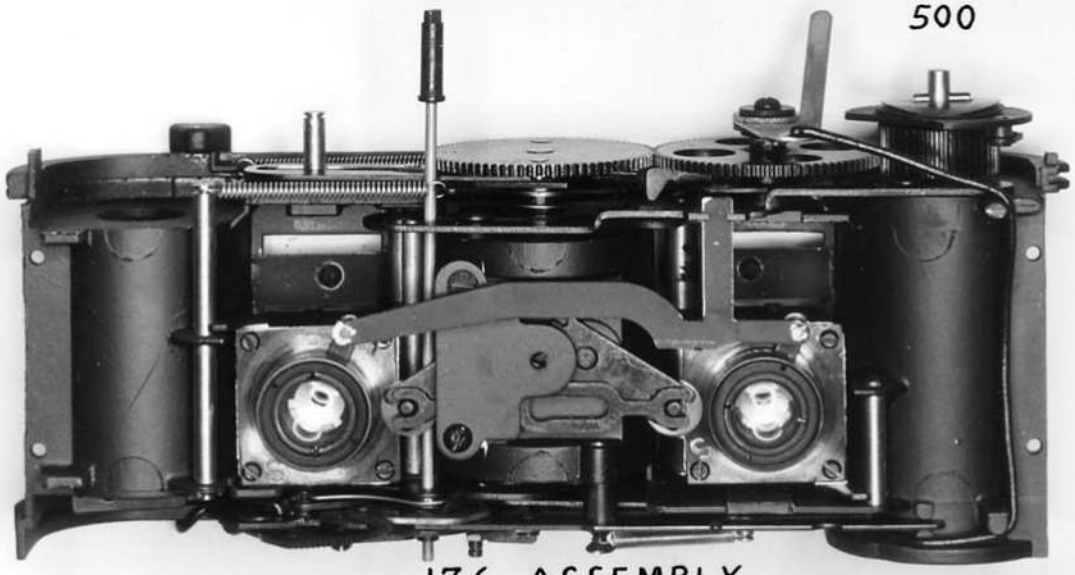

500 SHAFT
551 GEAR
212 SPRING
534 GEAR
503 GEAR
163
022
033
510
020
SELECTOR WIRE

906-5

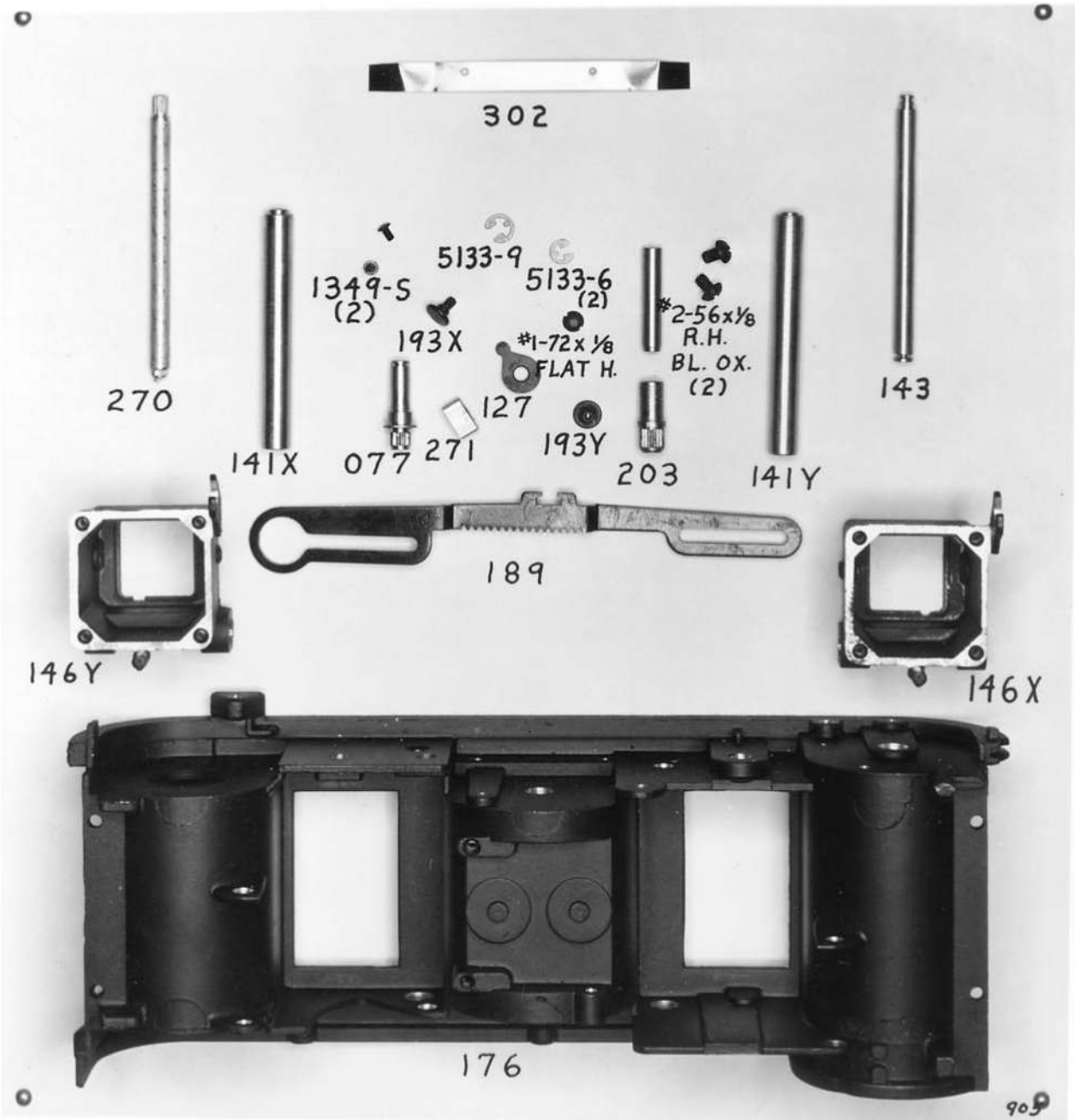


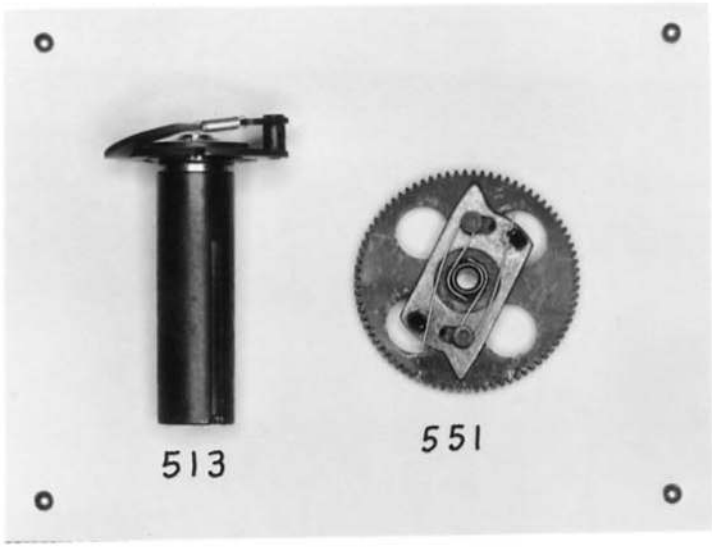
176 ASSEMBLY

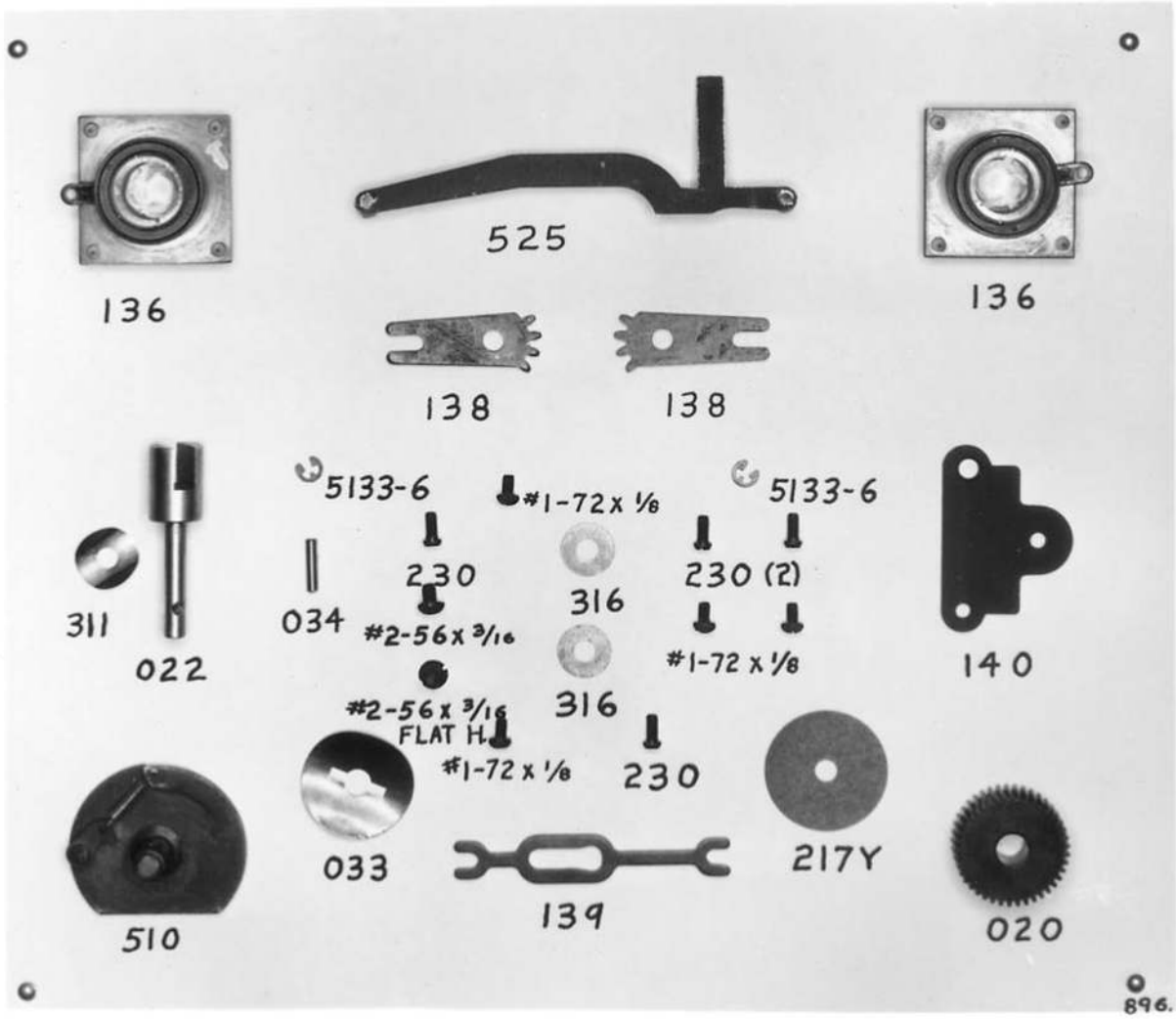


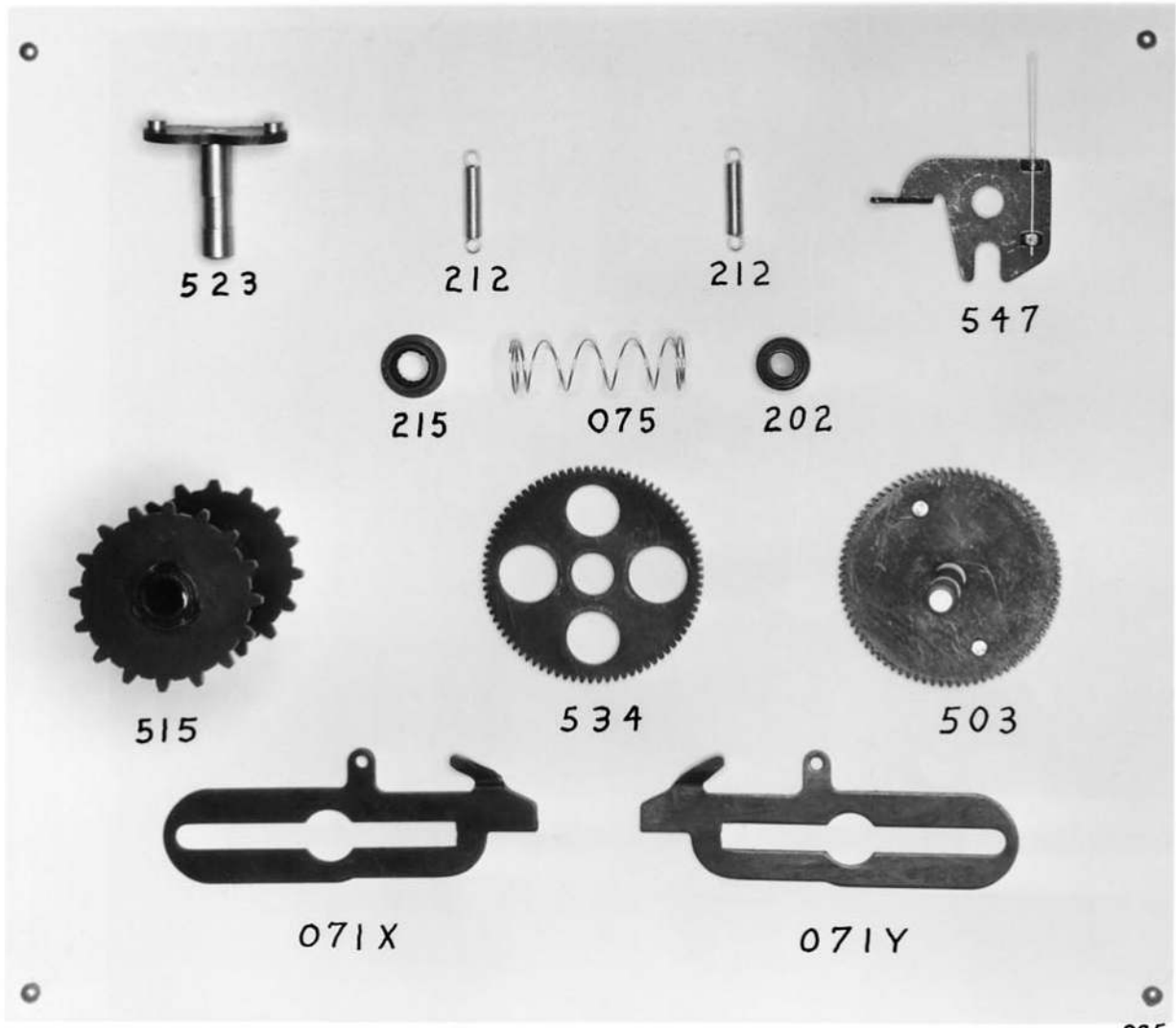


176 ASSEMBLY

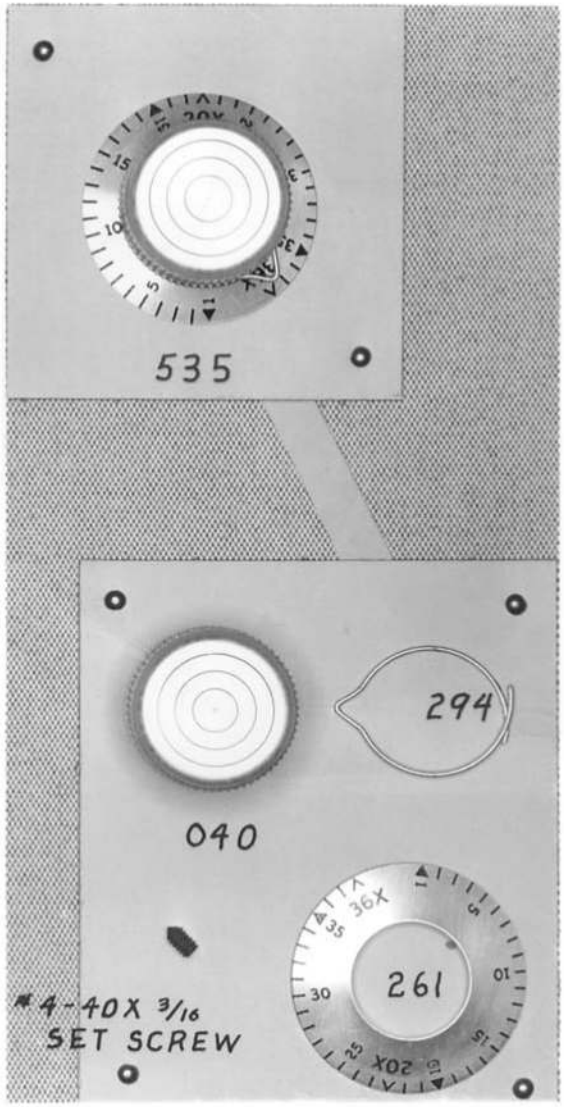

302
5133-9
1349-S
(2)
5133-6
(2)
#2-56x1/8
R.H.
BL. OX.
(2)
193X
#1-72x1/8
FLAT H.
270
127
143
141X
077
271
193Y
203
141Y
189
146Y
146X
176
909

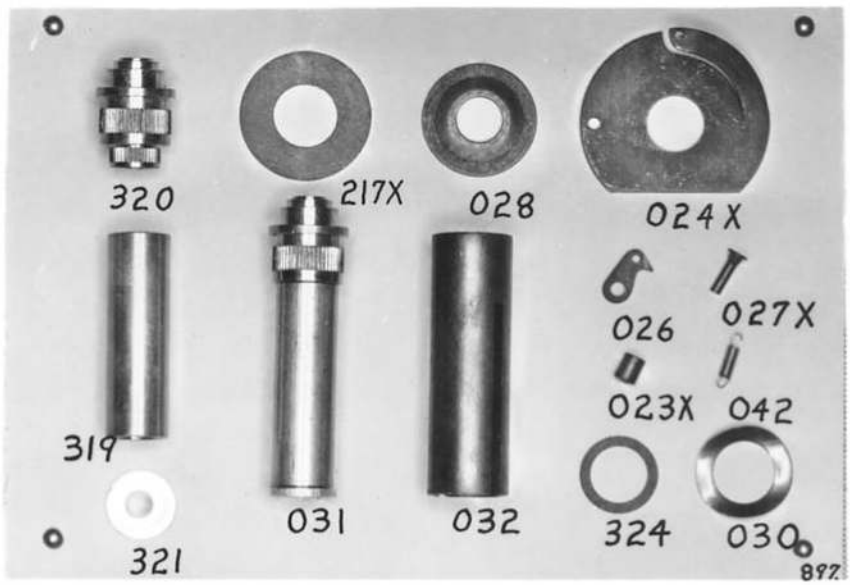

513
551

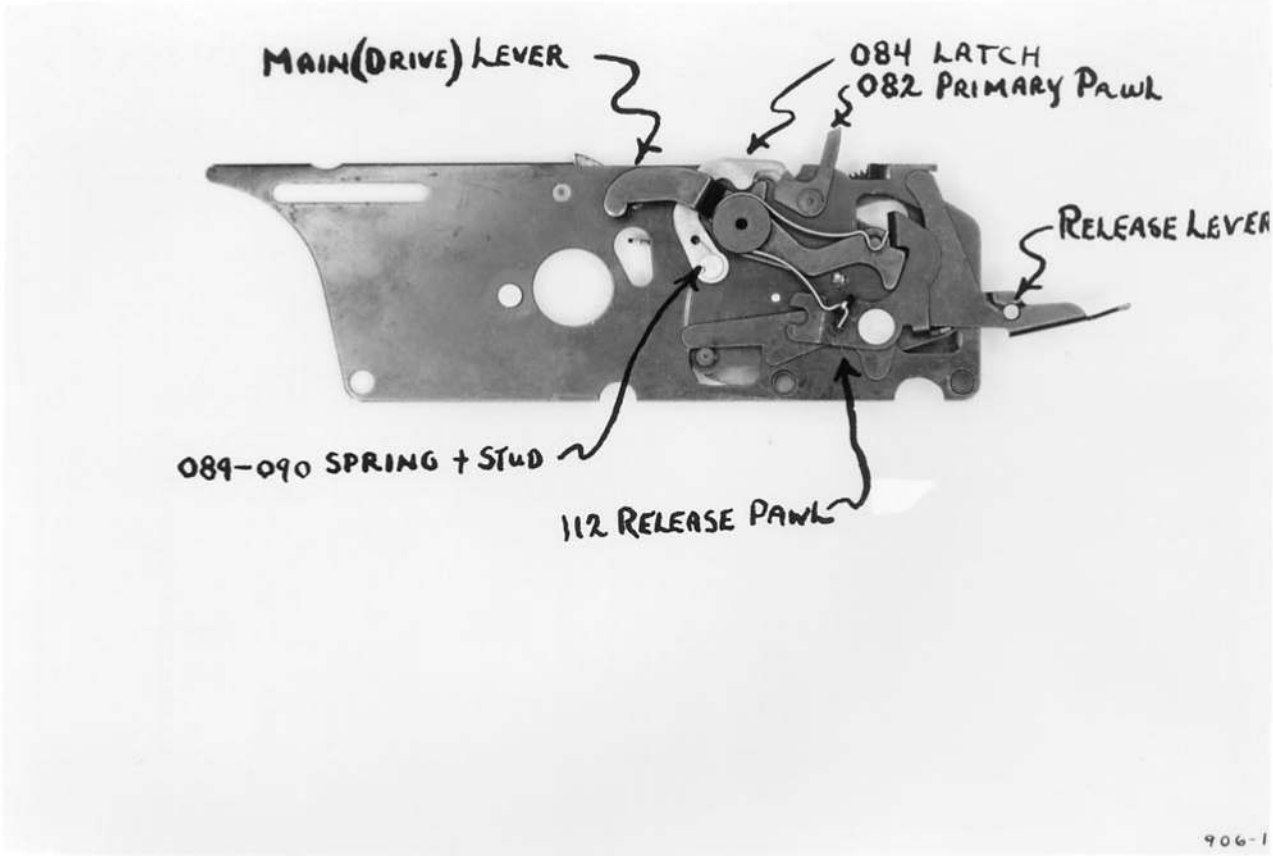

136
525
136
138
138
5133-6
#1-72 x 1/8
5133-6
230
230 (2)
311
034
#2-56 x 3/16
316
316
#1-72 x 1/8
140
022
#2-56 x 3/16
FLAT H.
#1-72 x 1/8
230
033
217Y
139
510
020
896.



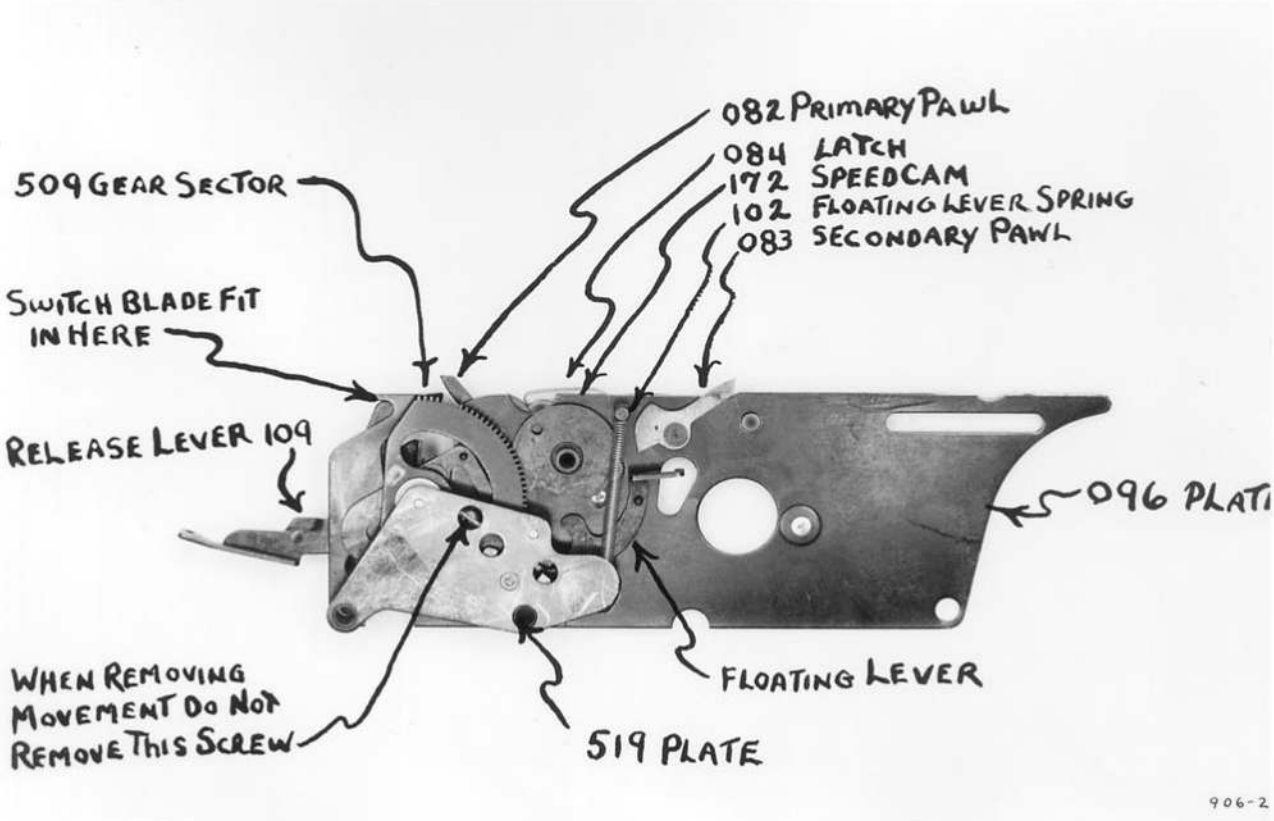
895.


535
294
040
261
#4-40X 3/16
SET SCREW

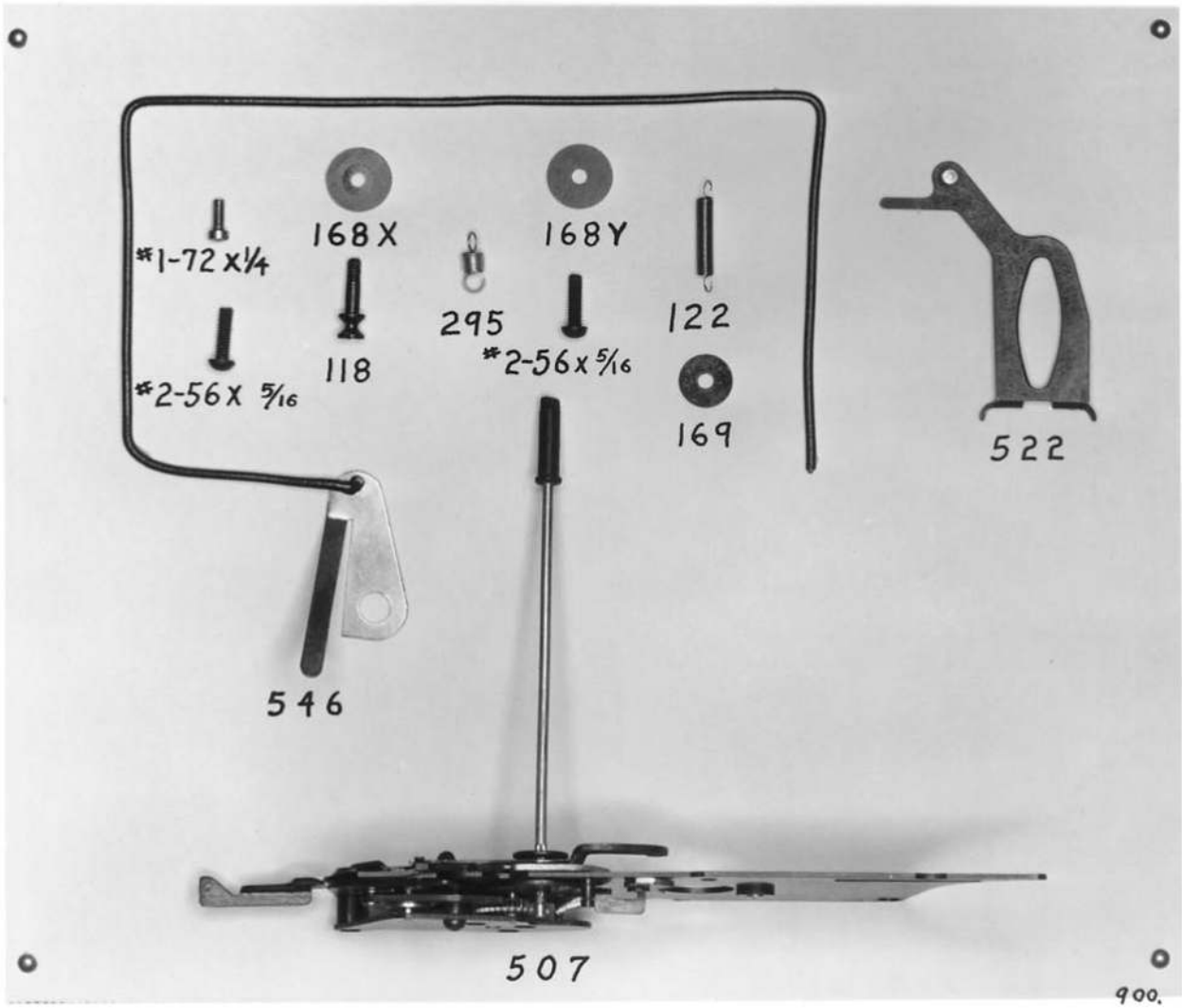

320
217X
028
024X
026
027X
023X
042
319
031
032
324
030
321
897


MAIN(DRIVE) LEVER
084 LATCH
082 PRIMARY PAWL
RELEASE LEVER
089-090 SPRING + STUD
112 RELEASE PAWL

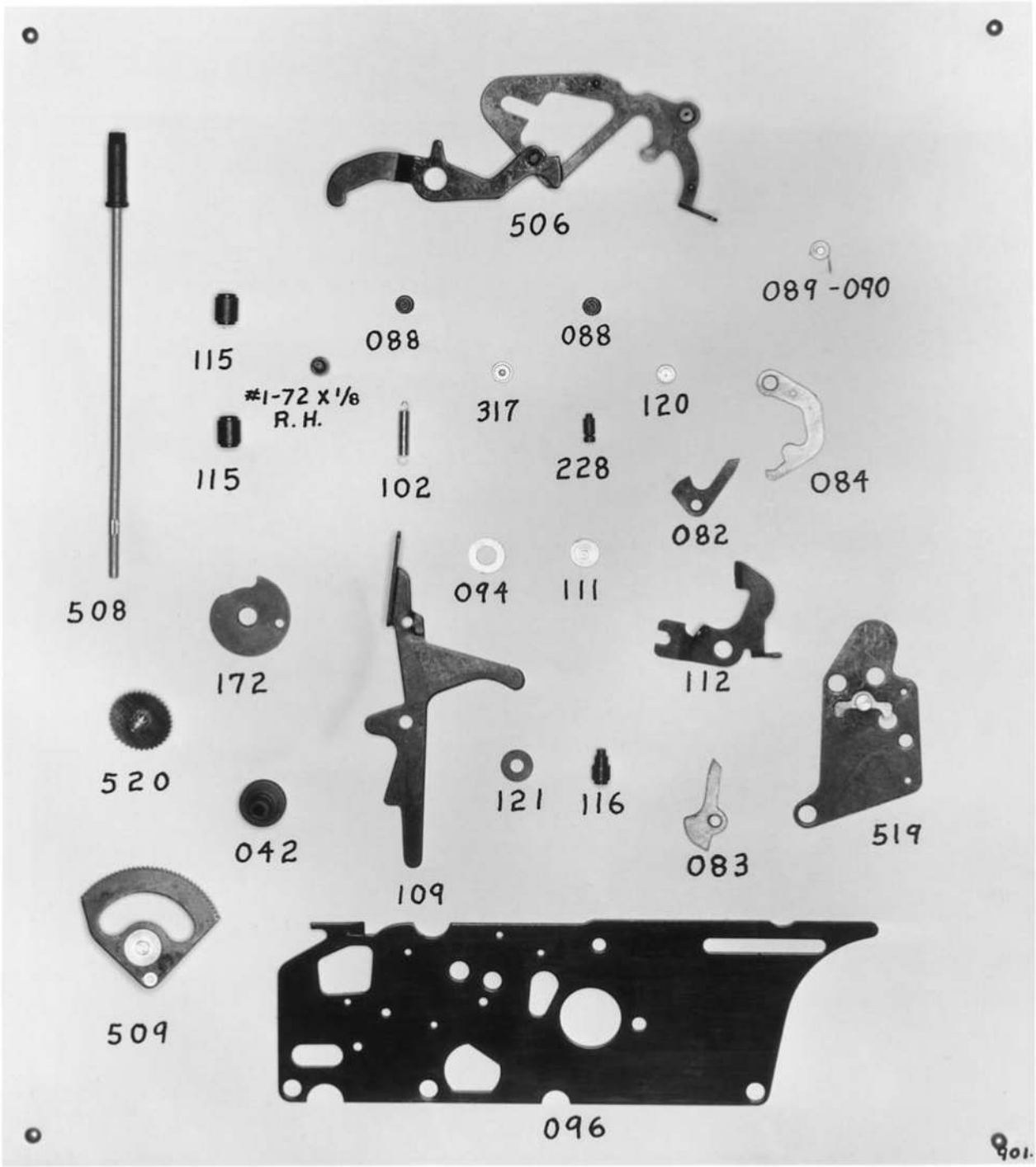
906-1

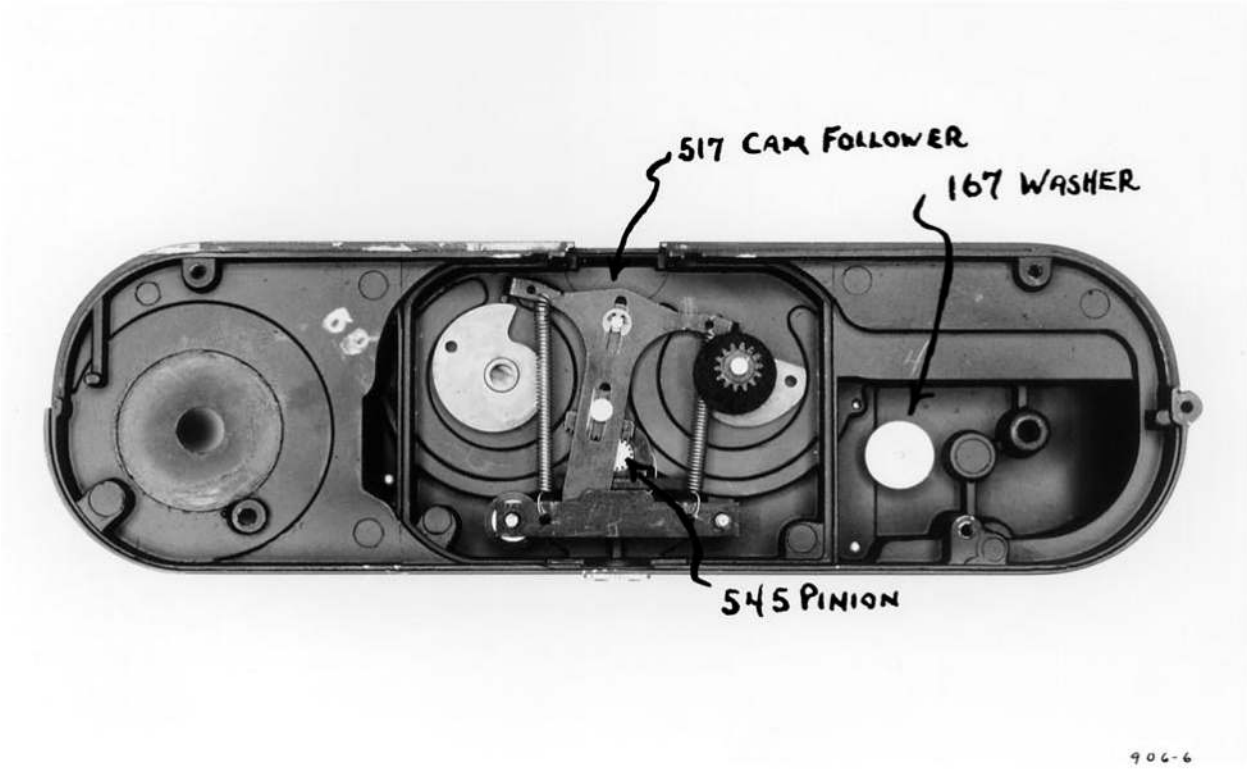

082 PRIMARY PAWL
084 LATCH
172 SPEEDCAM
102 FLOATING LEVER SPRING
083 SECONDARY PAWL
509 GEAR SECTOR
SWITCH BLADE FIT IN HERE
RELEASE LEVER 109
096 PLATE
WHEN REMOVING MOVEMENT DO NOT REMOVE THIS SCREW
519 PLATE
FLOATING LEVER

906-2

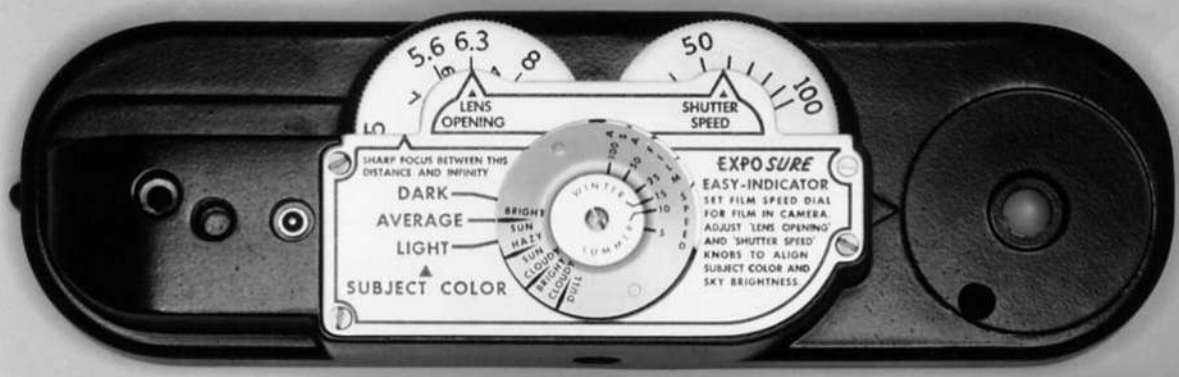


900.

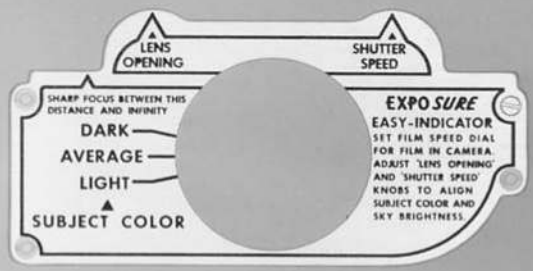

506
089-090
115
088
088
#1-72 X 1/8
R.H.
317
120
115
102
228
084
082
508
094
111
172
112
520
121
116
519
042
083
109
509
096
901



906-6



177 ASSEMBLY


LENS OPENING
SHUTTER SPEED
SHARP FOCUS BETWEEN THIS DISTANCE AND INFINITY
DARK
AVERAGE
LIGHT
SUBJECT COLOR
EXPOSURE
EASY-INDICATOR
SET FILM SPEED DIAL FOR FILM IN CAMERA. ADJUST 'LENS OPENING' AND 'SHUTTER SPEED' KNOBS TO ALIGN SUBJECT COLOR AND SKY BRIGHTNESS.

046

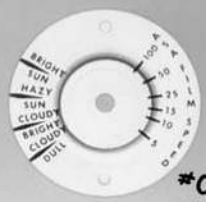
323

322

531

055

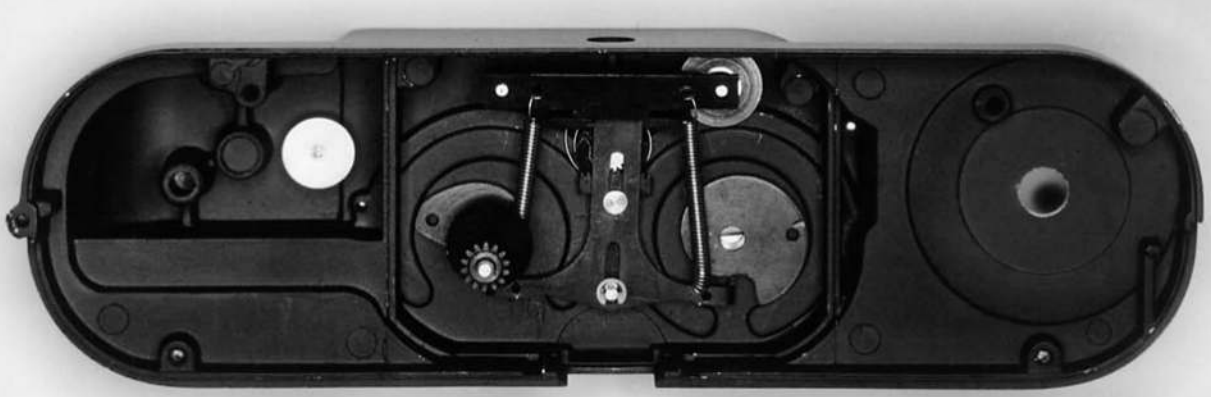
303



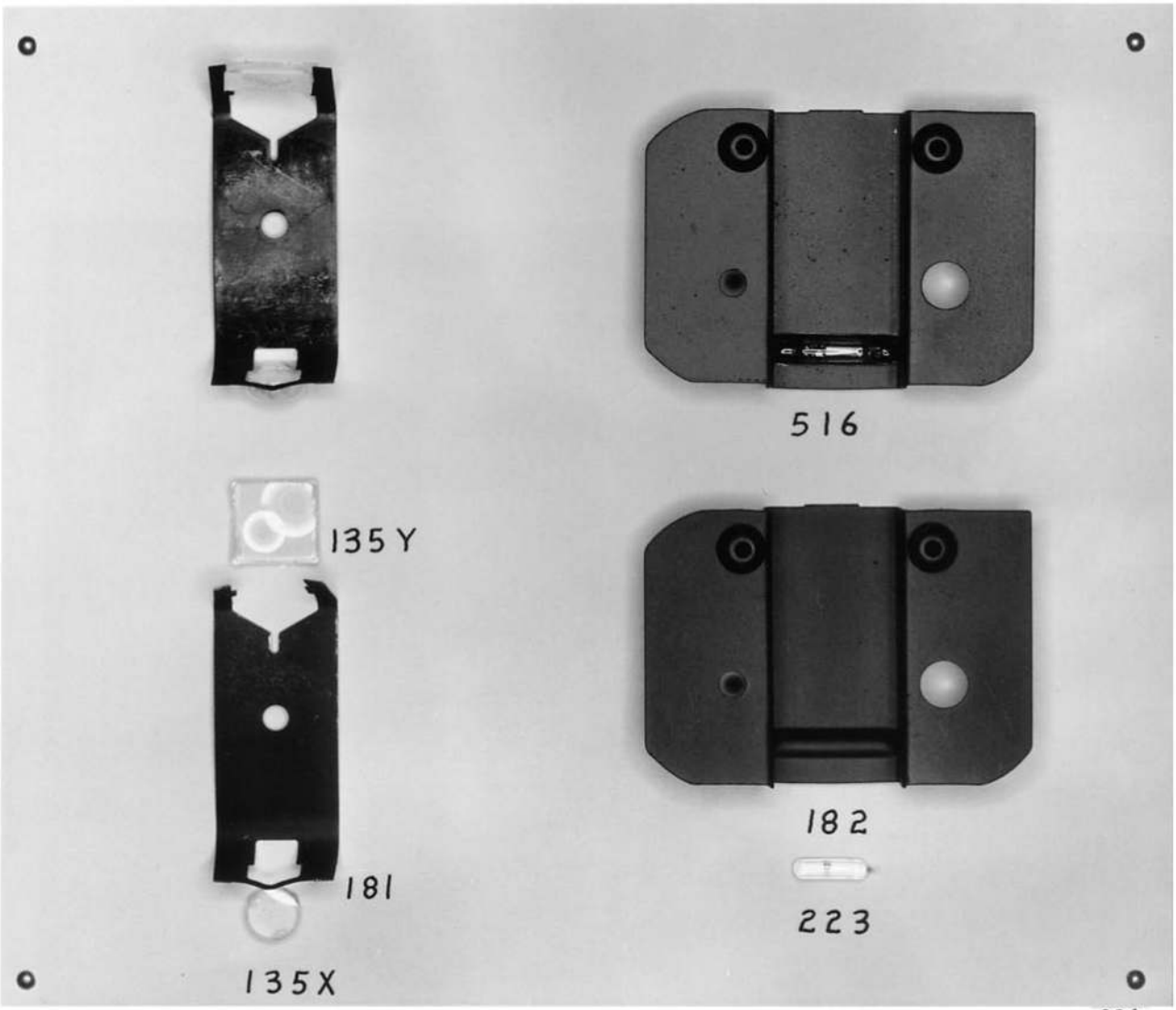
054

#0-80X 1/8
FLAT HEAD
N.P. (3)

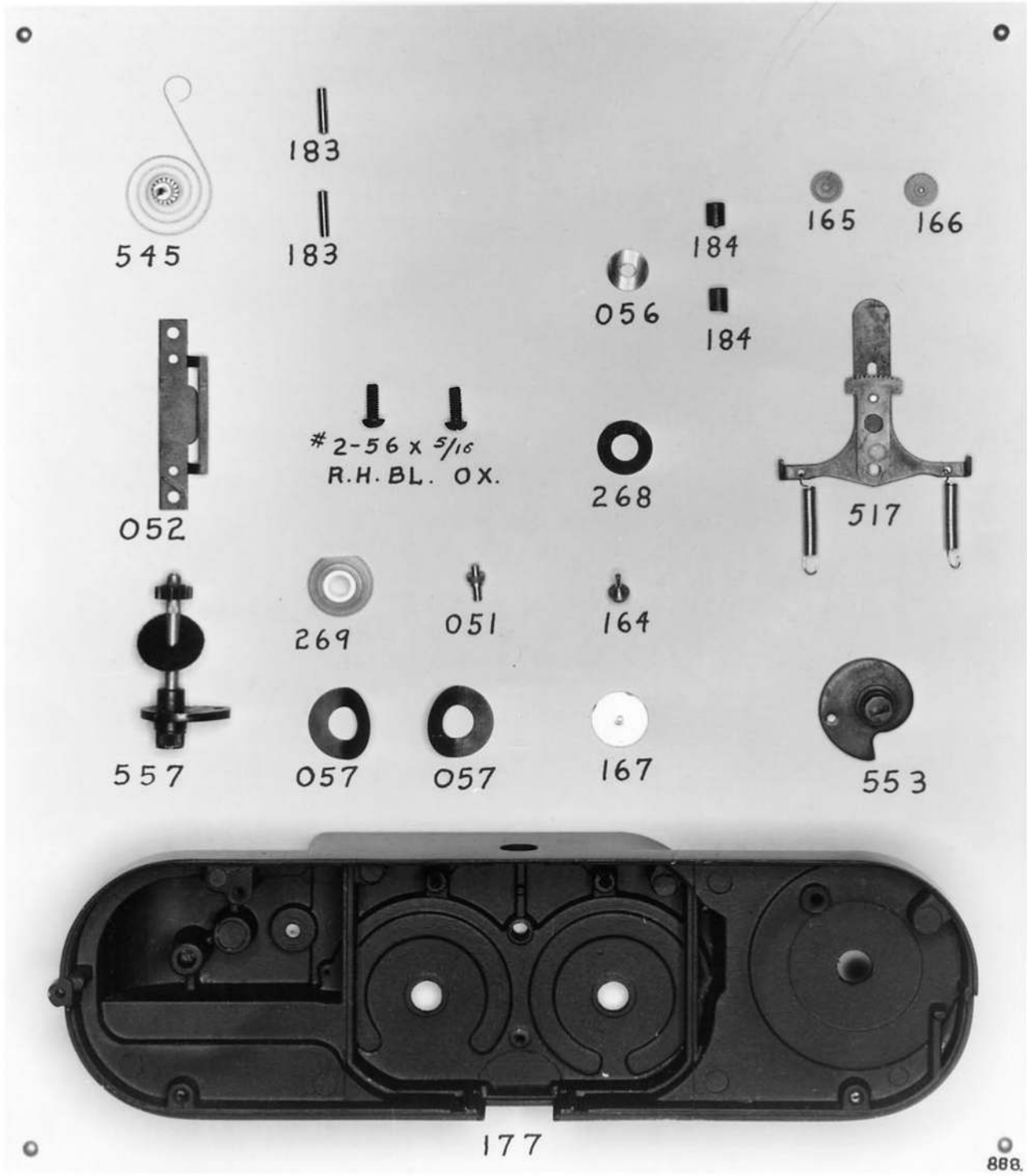
532

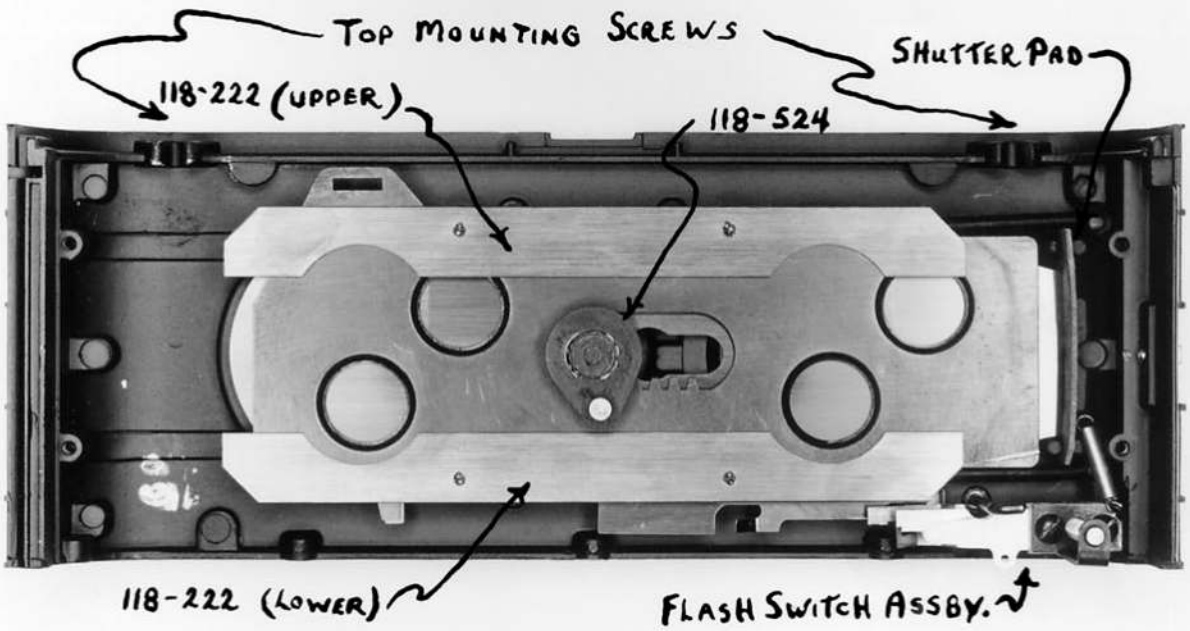


157 ASSEMBLY



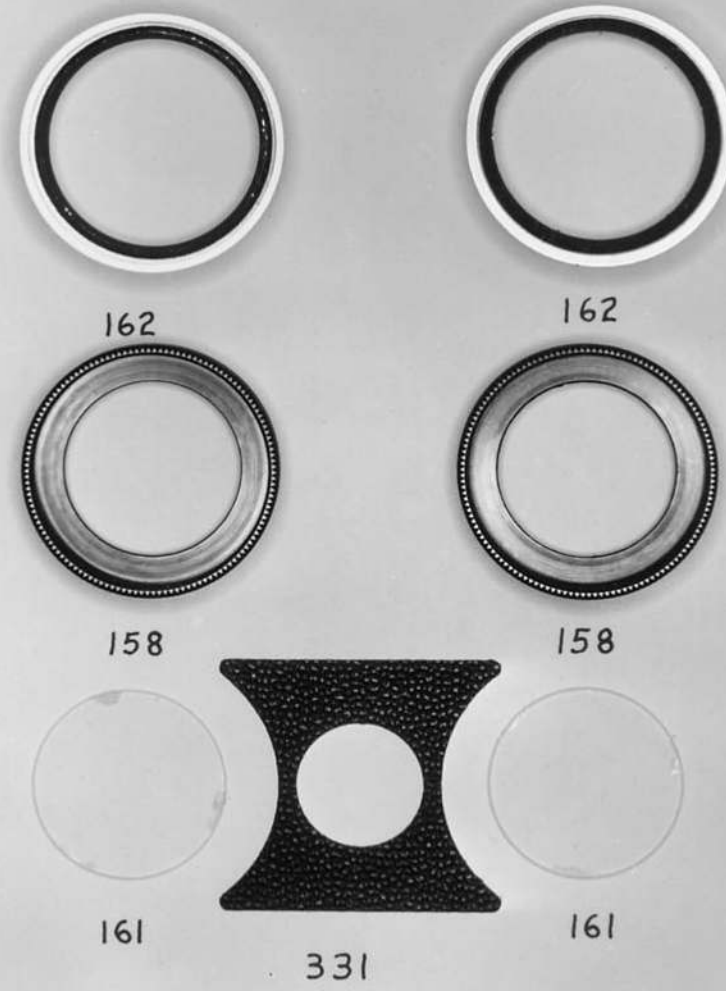
894.

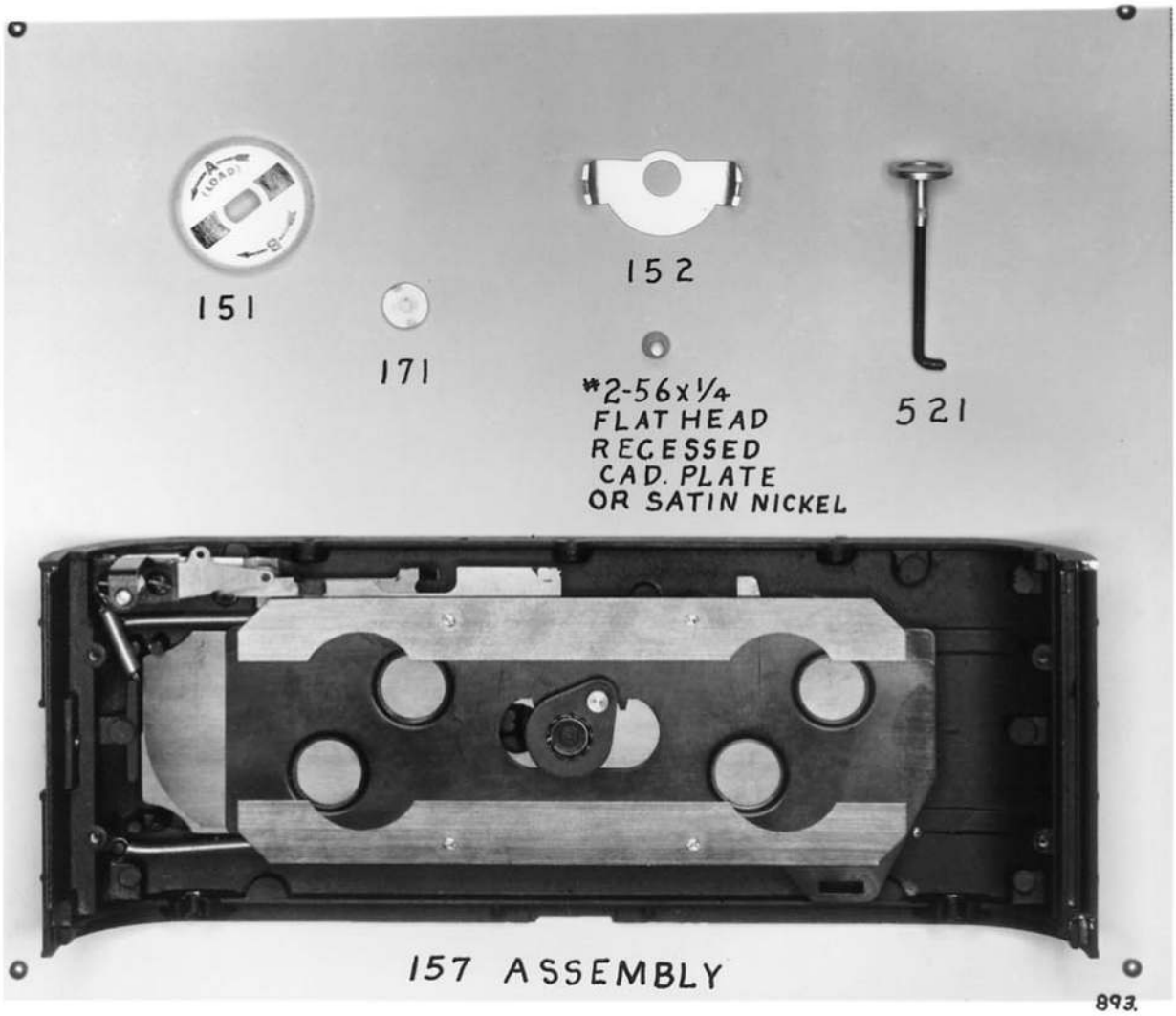

545
183
183
184
165
166
056
184
052
#2-56 x 5/16
R.H. BL. OX.
268
517
269
051
164
557
057
057
167
553
177
888

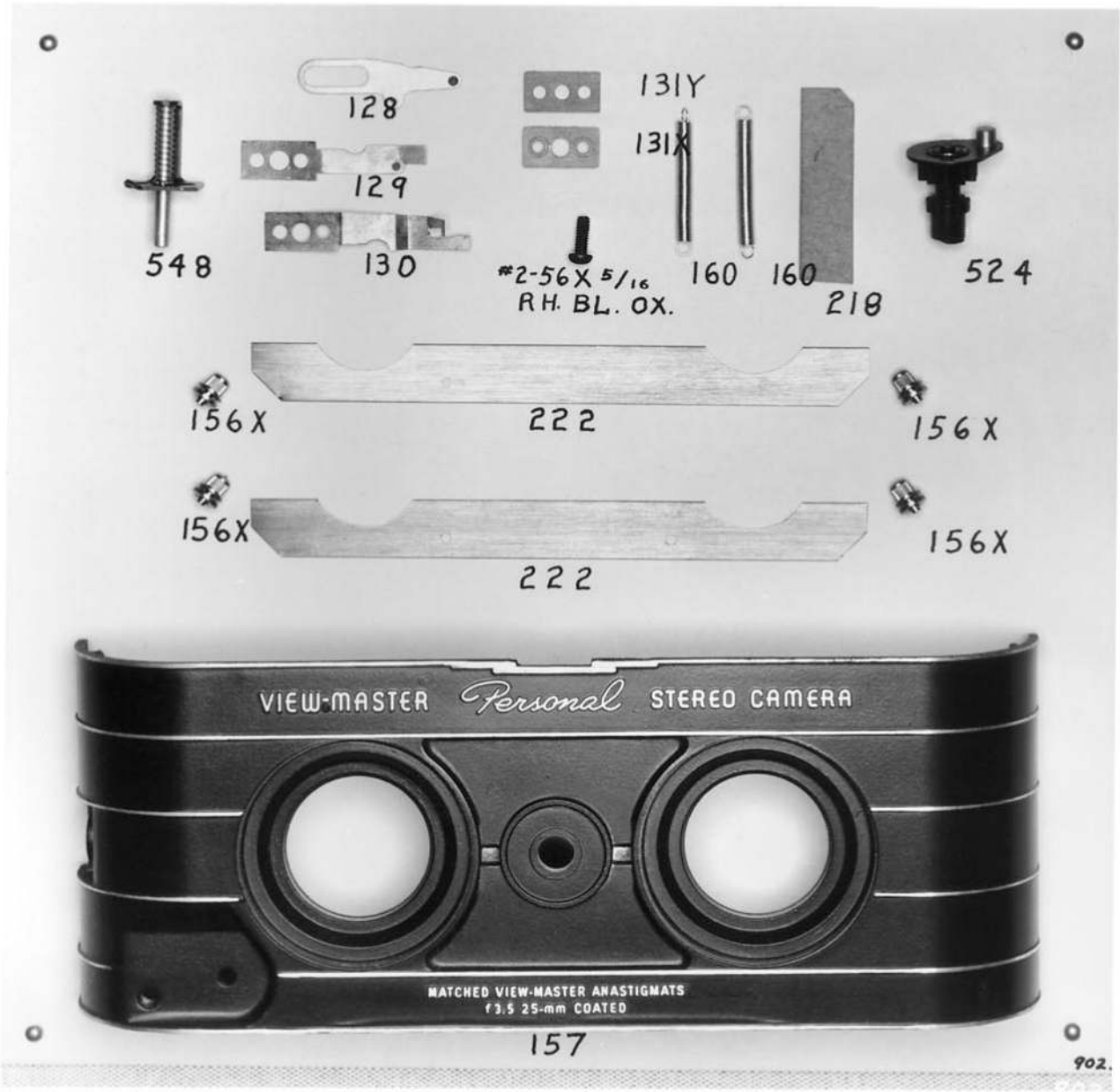

TOP MOUNTING SCREWS
SHUTTER PAD
118-222 (UPPER)
118-524
118-222 (LOWER)
FLASH SWITCH ASSBY.

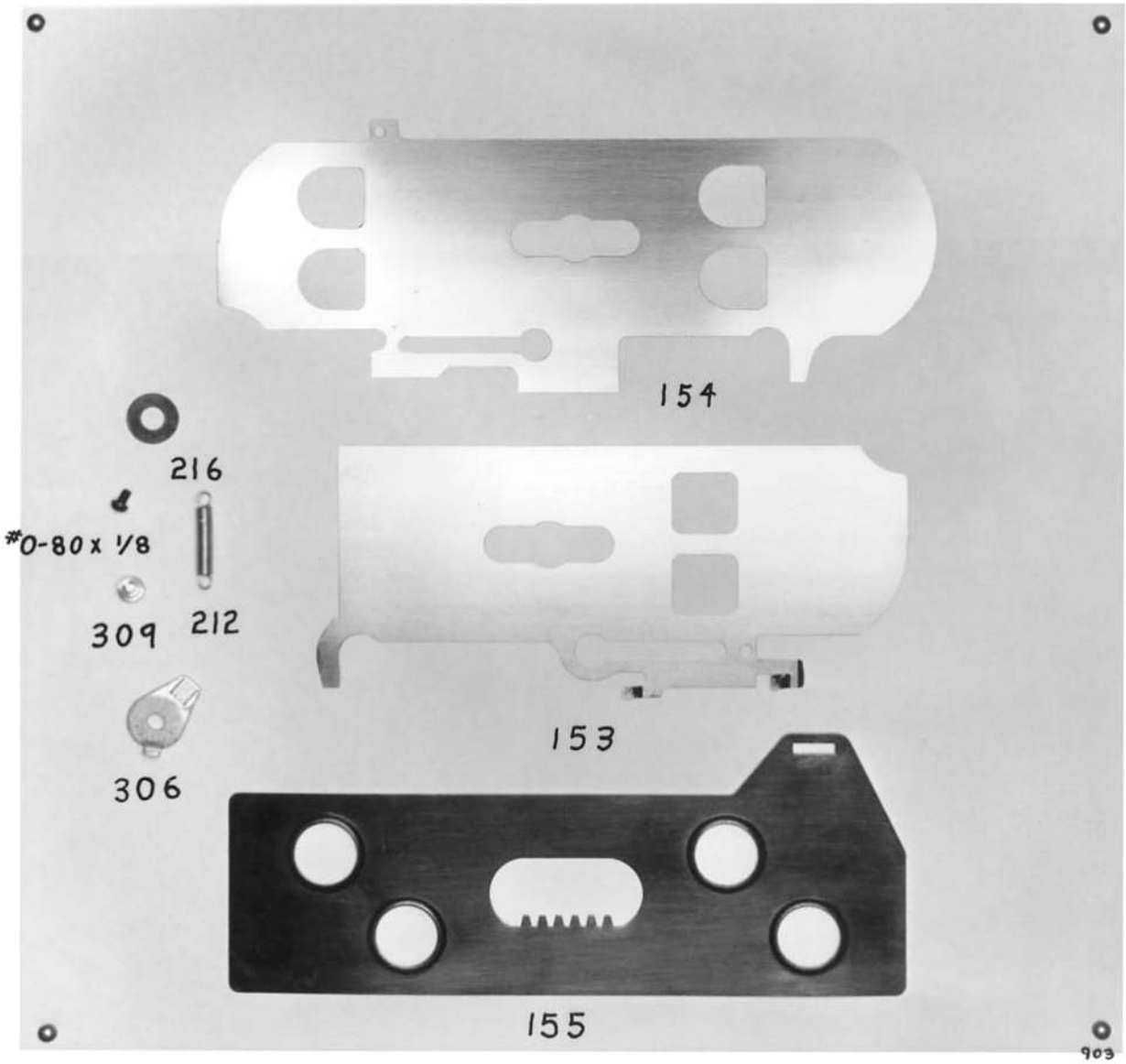
906-8

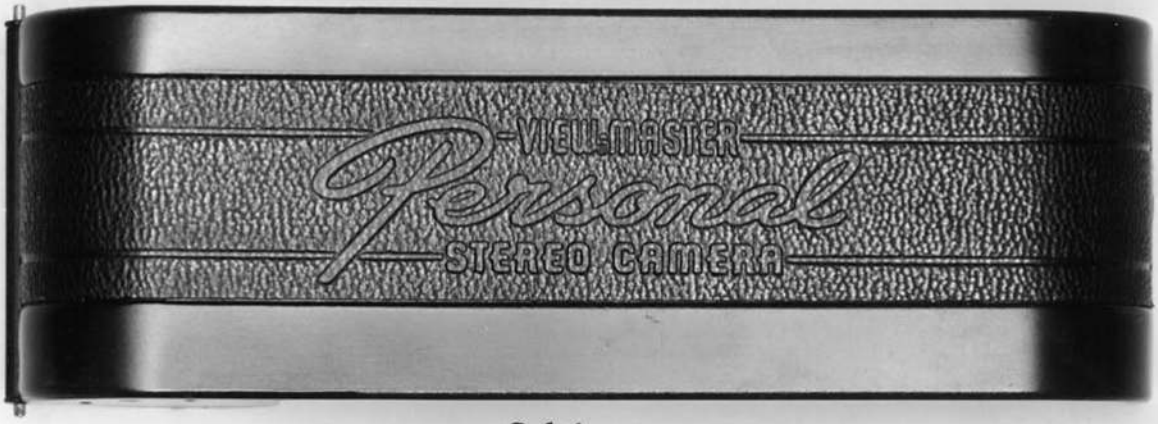
157 ASSEMBLY




151
171
152
*2-56x1/4
FLAT HEAD
RECESSED
CAD. PLATE
OR SATIN NICKEL
521
157 ASSEMBLY
893.

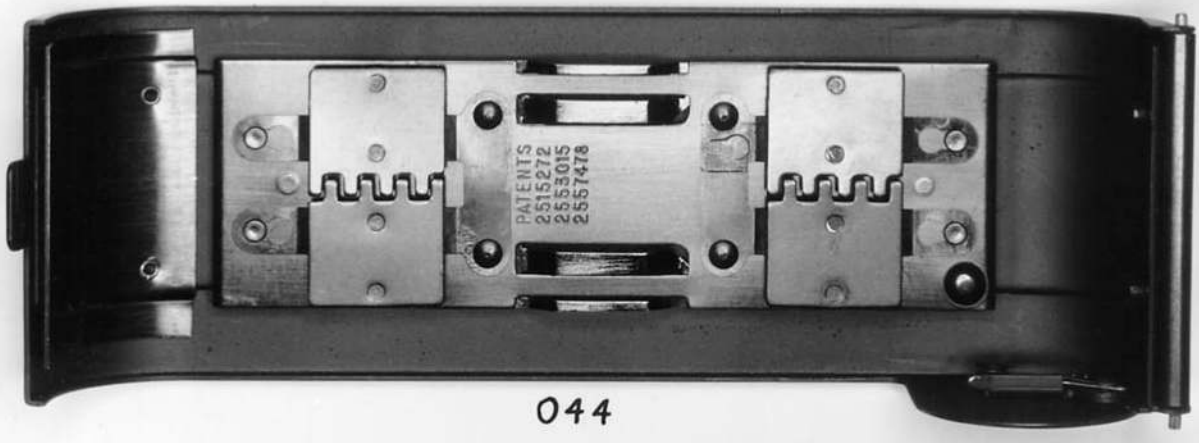

128
131Y
131X
129
548
130
#2-56X 5/16
R.H. BL. OX.
160
160
218
524
156X
222
156X
156X
222
156X
VIEW-MASTER Personal STEREO CAMERA
MATCHED VIEW-MASTER ANASTIGMATS
f3.5 25-mm COATED
157


154
216
#0-80 x 1/8
212
309
153
306
155
903



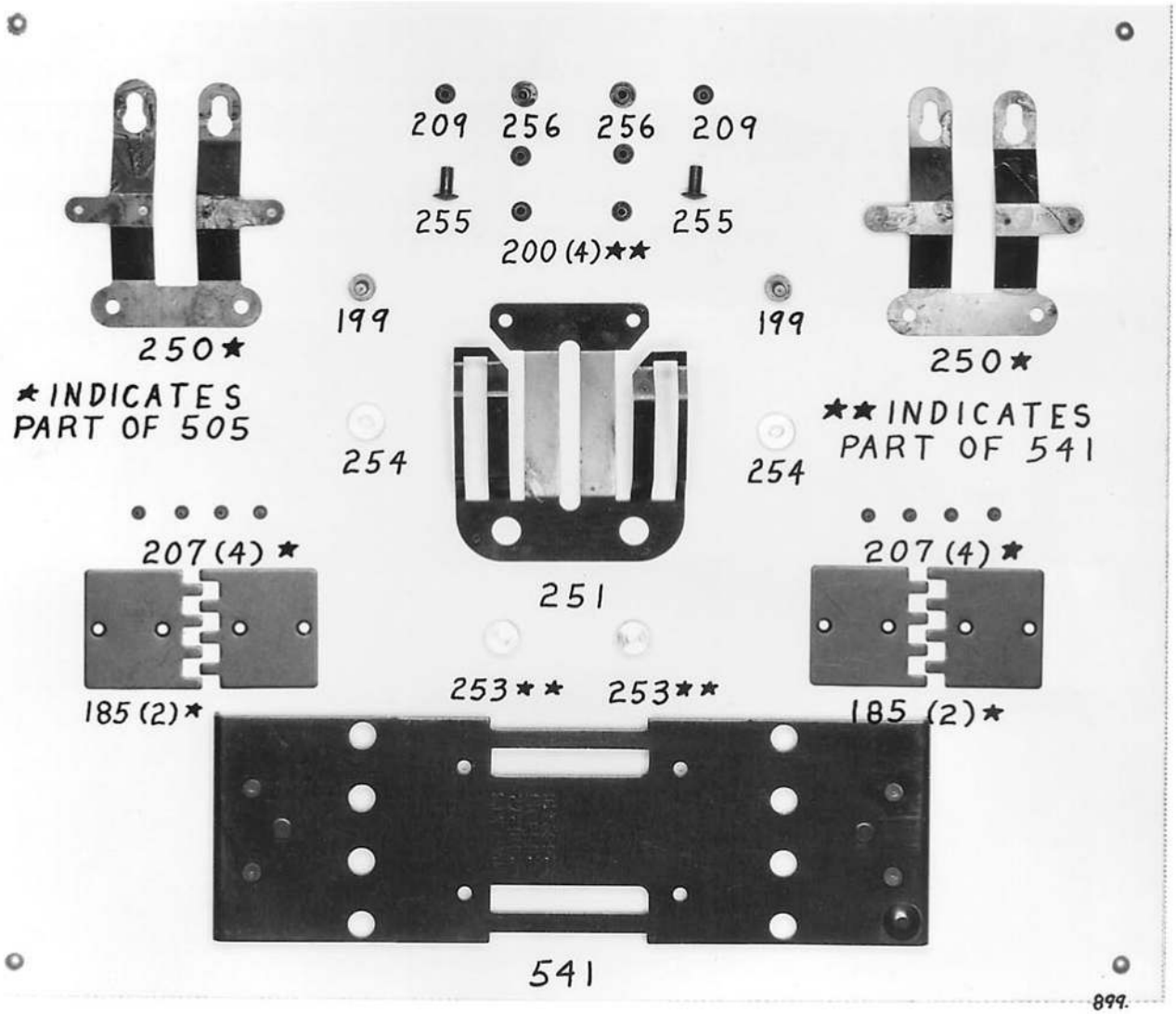
044

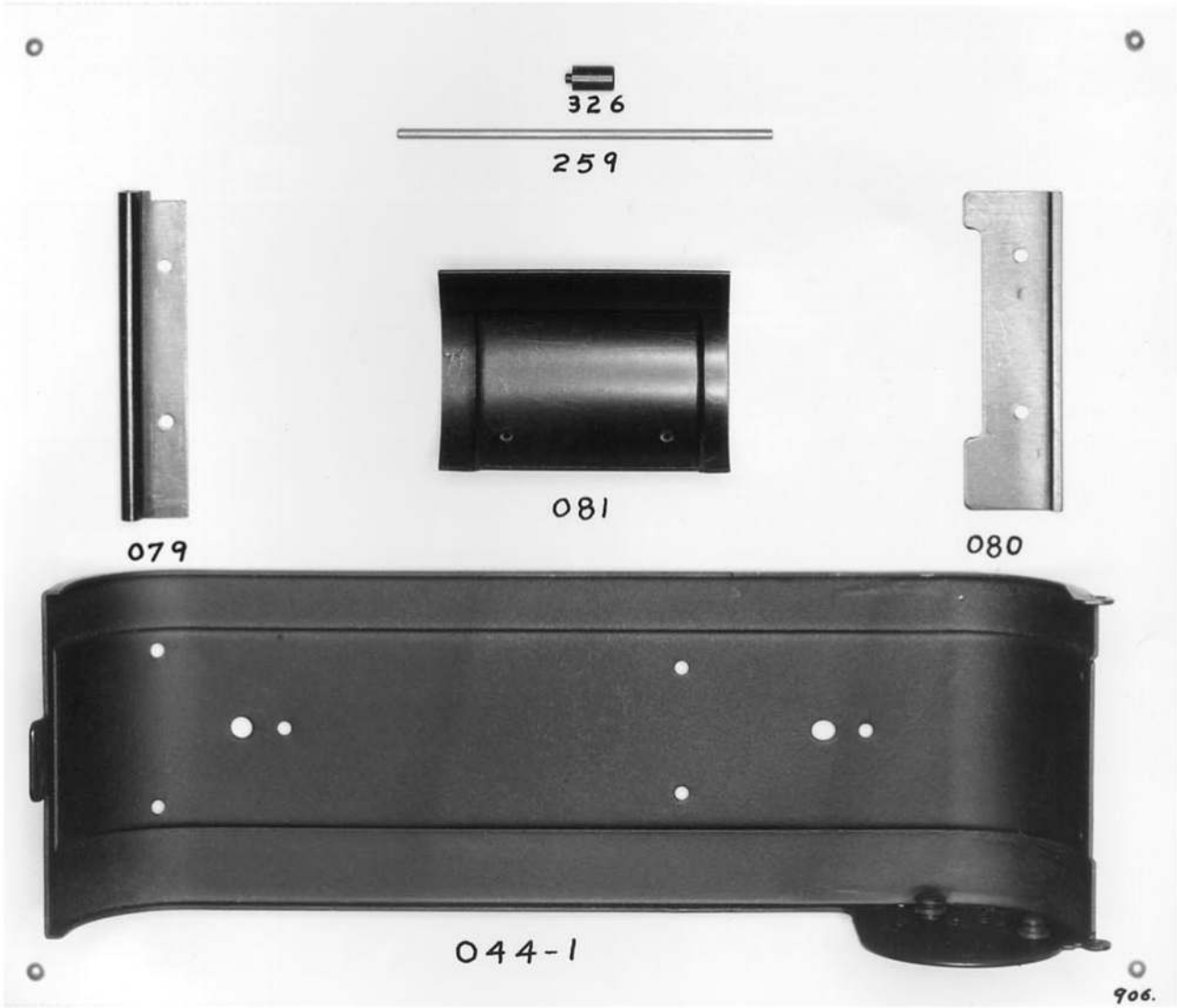
201

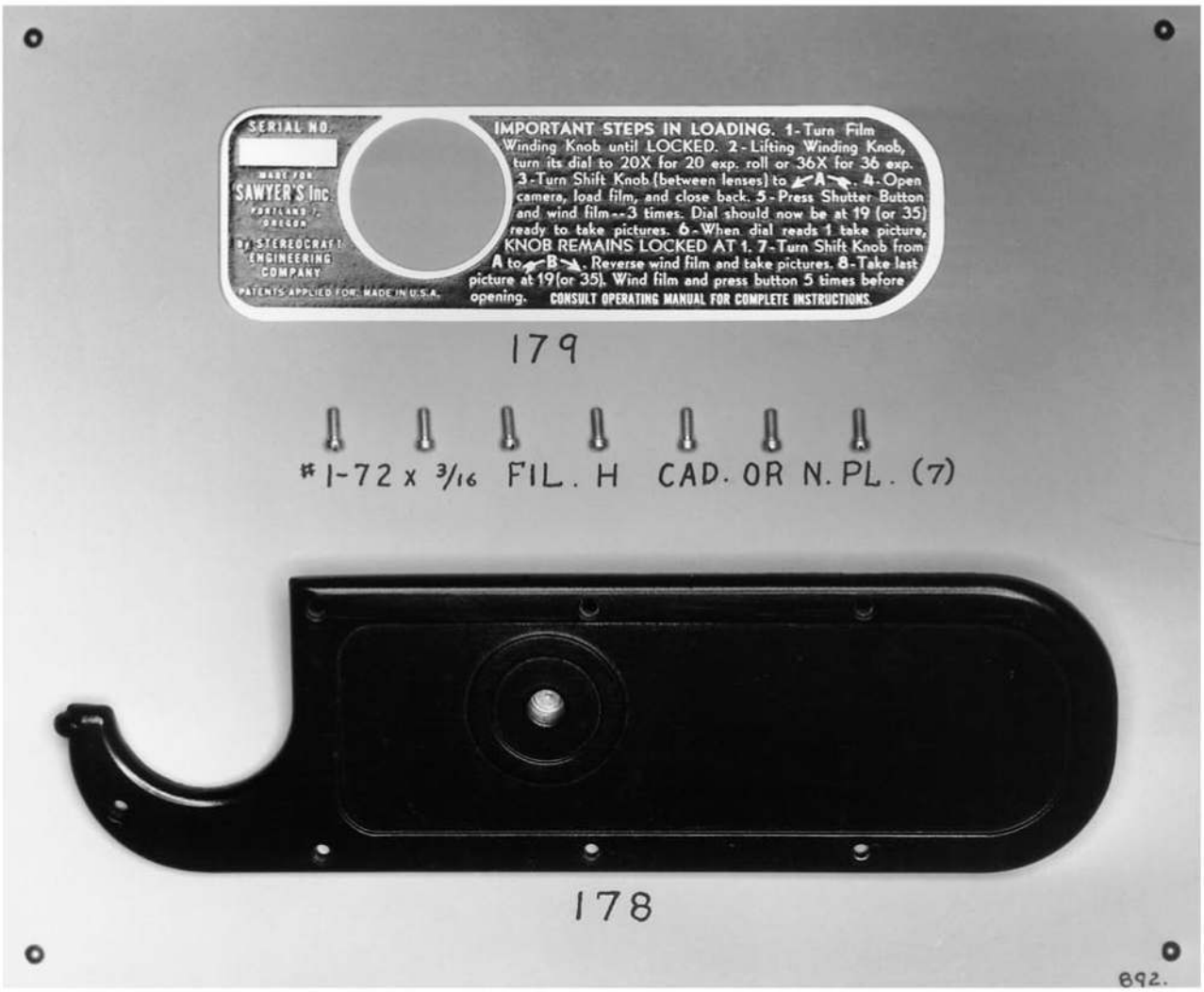


044

541-B


209
256
256
209
255
255
200 (4)★★
199
199
250★
250★
★INDICATES PART OF 505
★★INDICATES PART OF 541
254
254
207 (4) ★
207 (4) ★
251
253★★
253★★
185 (2)★
185 (2)★
541
899.


326
259
081
079
080
044-1
906.


SERIAL NO.
MADE FOR
SAWYER'S Inc.
PORTLAND, OREGON
BY STEREOCRAFT ENGINEERING COMPANY
PATENTS APPLIED FOR. MADE IN U.S.A.
IMPORTANT STEPS IN LOADING. 1-Turn Film Winding Knob until LOCKED. 2-Lifting Winding Knob, turn its dial to 20X for 20 exp. roll or 36X for 36 exp. 3-Turn Shift Knob (between lenses) to A. 4-Open camera, load film, and close back. 5-Press Shutter Button and wind film--3 times. Dial should now be at 19 (or 35) ready to take pictures. 6-When dial reads 1 take picture, KNOB REMAINS LOCKED AT 1. 7-Turn Shift Knob from A to B. Reverse wind film and take pictures. 8-Take last picture at 19 (or 35). Wind film and press button 5 times before opening. CONSULT OPERATING MANUAL FOR COMPLETE INSTRUCTIONS.
179
#1-72 x 3/16 FIL. H CAD. OR N. PL. (7)
178
892.

Written by
Dave Hitchcock